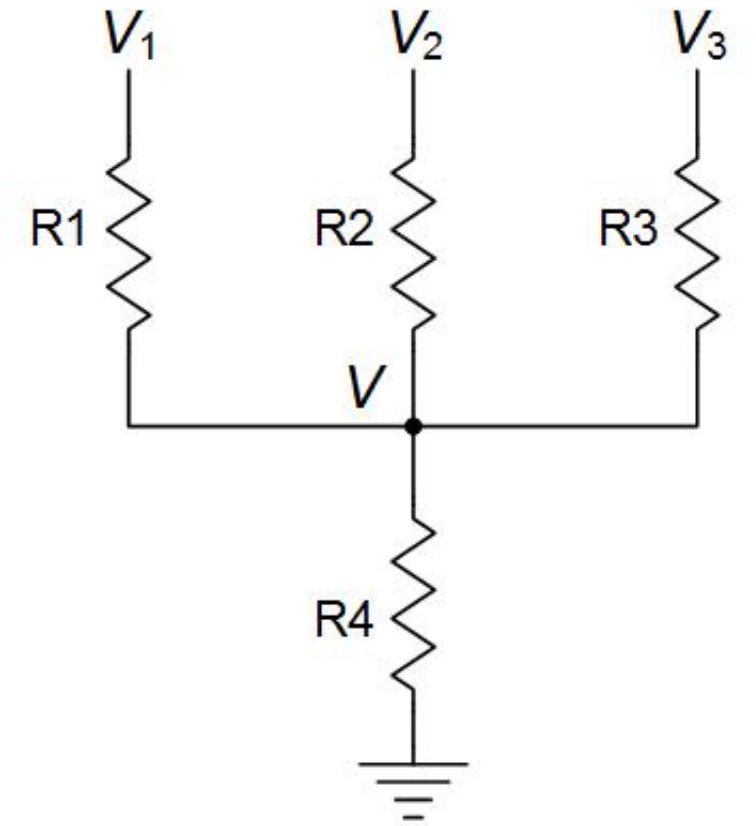
Started on	Friday, 8 September 2017, 7:40 PM
State	Finished
Completed on	Friday, 8 September 2017, 9:34 PM
Time taken	1 hour 54 mins
Grade	**9.5** out of 10.0 (**95**%)

Question 1

Correct

Mark 1.0 out of 1.0



For the circuit shown, what is the value of the voltage V in volts? Use: V1 = 5.8V, V2 = 4.9V, V3 = 12.2V, R1 = 3.3kΩ, R2 = 9.2kΩ, R3 = 1.2kΩ, and R4 = 8.0kΩ.

Answer: 9.09

The correct answer is: 9.09

Correct

Marks for this submission: 1.0/1.0.

Question 2

Correct

Mark 1.0 out of 1.0

If a 30.2kΩ resistor, a 33.9kΩ resistor and a 41.2kΩ resistor are all connected in parallel, then what is the total resistance of this parallel combination in kilohms?

Answer: 11.43

The correct answer is: 11.51

Correct

Marks for this submission: 1.0/1.0.

Question 3

Correct

Mark 1.0 out of 1.0

If a 15.0V voltage source is applied across a 17.4kΩ resistor connected in series with a 6.7kΩ resistor, then what is the voltage across the 17.4kΩ resistor in volts?

Answer: 10.83

The correct answer is: 10.83

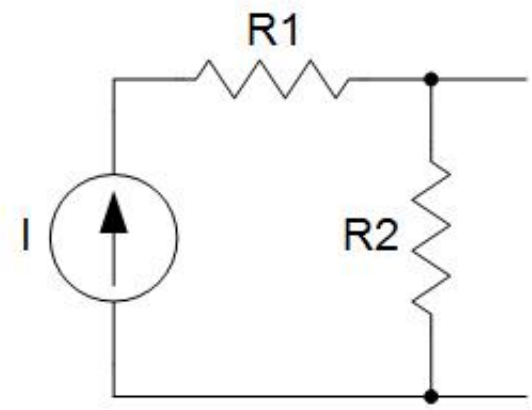
Correct

Marks for this submission: 1.0/1.0.

Question 4

Correct

Mark 1.0 out of 1.0



Use Norton's Theorem to find the value of the Norton equivalent resistance for the circuit shown in kilohms. Use: I = 5.2mA, R1 = 49.5kΩ and R2 = 26.1kΩ.

Answer: 26.1

The correct answer is: 26.10

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 lag the phase of the current flowing through it by 90 degrees?

Select one:

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

The correct answer is: Capacitors

Correct

Marks for this submission: 1.0/1.0.

Question 6

Correct

Mark 0.5 out of 1.0

If at t=0 a constant voltage is applied across an ideal inductor which initially has zero current flowing through it, then the current in the inductor will :

Select one:

- a. Grow at a constant rate ✓
- b. Grow at first, but then reach a constant value
- c. Grow at an increasing rate as time passes
- d. None of these
- e. Stay at zero amperes and not change

The correct answer is: Grow at a constant rate

Correct

Marks for this submission: 1.0/1.0. Accounting for previous tries, this gives **0.5/1.0**.

Question 7

Correct

Mark 1.0 out of 1.0

If a circuit has 3 nodes and 3 loops in it, then :

Select one:

- a. Nodal analysis will require solving more equations than Mesh analysis
- b. It is impossible to determine which method will require solving more equations
- c. None of these
- d. Both Nodal and Mesh analysis will require solving the same number of equations ✓
- e. Mesh analysis will require solving more equations than Nodal analysis

The correct answer is: Both Nodal and Mesh analysis will require solving the same number of equations

Correct

Marks for this submission: 1.0/1.0.

Question 8

Correct

Mark 1.0 out of 1.0

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

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 1.0/1.0.

Question 9

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 larger voltage across it than the other resistor.

Select one:

- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 1.0/1.0.

Question 10

Correct

Mark 1.0 out of 1.0

For an inductor, the phase of the voltage leads the current by 90 degrees.

Select one:

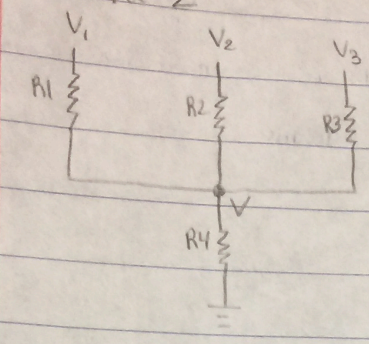
- True ✓
- False

The correct answer is 'True'.

Correct

Marks for this submission: 1.0/1.0.

Quiz 1a-2

① 

V = ?
V1 = 5.8V
V2 = 4.9V
V3 = 12.2V

R1 = 3.3kΩ
R2 = 9.2kΩ
R3 = 1.2kΩ
R4 = 8.0kΩ

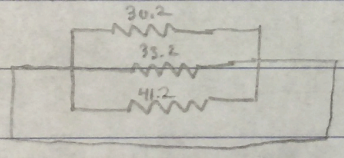
$$\frac{V-V1}{R1} + \frac{V-V2}{R2} + \frac{V-V3}{R3} + \frac{V}{R4} = 0$$

$$V\left[\frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3} + \frac{1}{R4}\right] = \frac{V1}{R1} + \frac{V2}{R2} + \frac{V3}{R3}$$

$$V\left[\frac{1}{3.3k} + \frac{1}{9.2k} + \frac{1}{1.2k} + \frac{1}{8.0k}\right] = \frac{5.8}{3.3k} + \frac{4.9}{9.2k} + \frac{12.2}{1.2k}$$

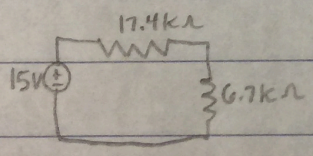
$V[1.37] = 12.45685$ $\quad \boxed{V = 9.09V}$

② If a 30.2 kΩ resistor, a 33.2 kΩ resistor, and a 41.2 kΩ resistor are all connected in parallel, then what is the total resistance of the parallel combination in kiloohms?



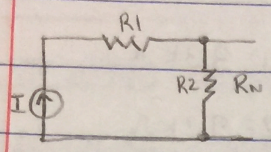
$$\frac{1}{R_t} = \frac{1}{30.2} + \frac{1}{33.2} + \frac{1}{41.2} = \frac{1}{0.0875} = \boxed{11.4279k\Omega}$$

③ If a 15V voltage source is applied across a 17.4kΩ resistor connected in series with a 6.7kΩ resistor, then what is the voltage across the 17.4kΩ resistor in volts?



$$V = \frac{17.4k}{17.4k+6.7k} \cdot 15V = \boxed{10.83V}$$

(4)



Use Norton's Theorem to find the value of the Norton equivalent resistance for the circuit shown in kilohms.

$I = 5.2\text{mA}$, $R1 = 49.5\text{k}\Omega$, $R2 = 26.1\text{k}\Omega$

$R_N = R_2 = \boxed{26.1\text{k}\Omega}$