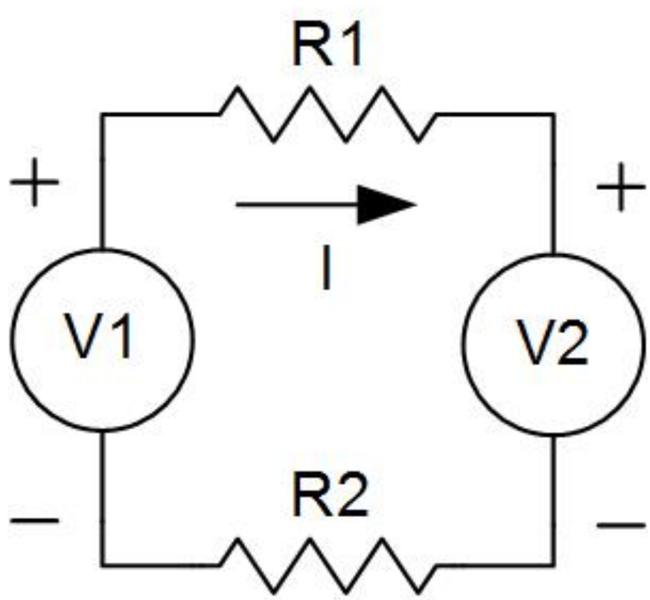
Started on	Thursday, 31 August 2017, 2:01 PM
State	Finished
Completed on	Friday, 8 September 2017, 1:32 PM
Time taken	7 days 23 hours
Grade	**5.0** out of 10.0 (**50**%)

Question 1

Correct

Mark 1.0 out of 1.0



For the circuit shown, what is the value of the current I in milliamps? Use: V1 = 6.9V, V2 = 8.5V, R1 = 6.7kΩ and R2 = 17.0kΩ.

Answer: -0.0675 ✓

The correct answer is: -0.068

Correct

Marks for this submission: 1.0/1.0.

Question 2

Correct

Mark 0.0 out of 1.0

What is the phase in degrees of the complex impedance, Z, for a 79Ω resistor in series with a 5.2pF capacitor at 92.7MHz?

Answer: -76.54

The correct answer is: -76.54

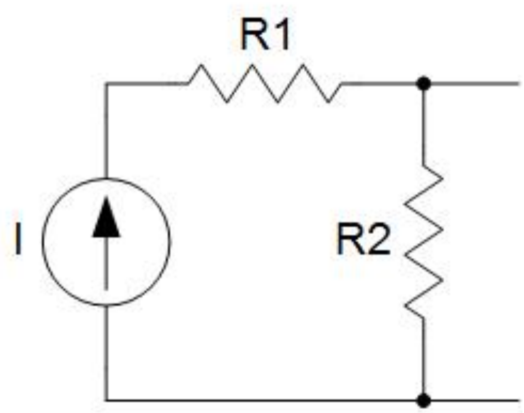
Correct

Marks for this submission: 1.0/1.0. Accounting for previous tries, this gives **0.0/1.0.**

Question 3

Correct

Mark 1.0 out of 1.0



Use Norton's Theorem to find the value of the short circuit output current for the circuit shown in milliamps. Use: I = 2.1mA, R1 = 38.1kΩ and R2 = 45.8kΩ.

Answer: 2.1

The correct answer is: 2.10

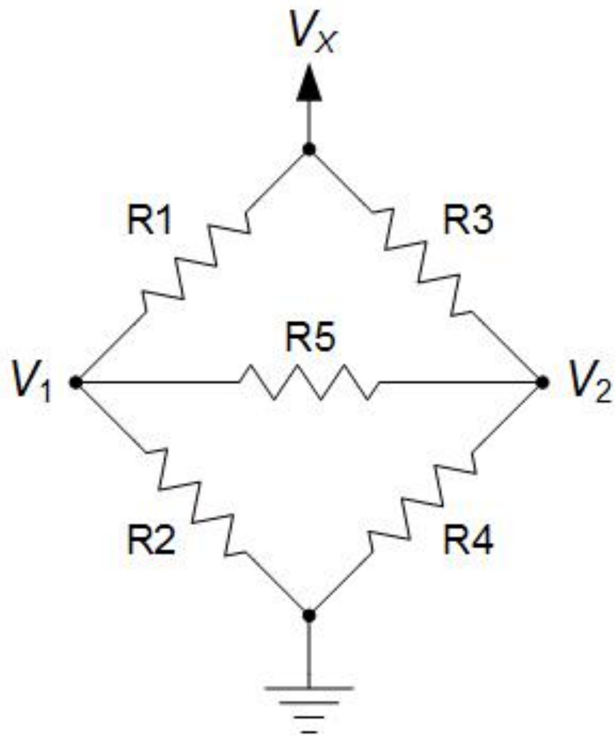
Correct

Marks for this submission: 1.0/1.0.

Question 4

Correct

Mark 1.0 out of 1.0



For the bridge circuit shown what is V12, the voltage across R5, in millivolts? (Hint: Use Thevenin equivalents to solve this problem more easily.) Use: Vx = 3.2V, R1 = 4.5kΩ, R2 = 8.4kΩ, R3 = 5.1kΩ, R4 = 7.3kΩ and R5 = 7.6kΩ.

Answer: 112.34

The correct answer is: 112.2

Correct

Marks for this submission: 1.0/1.0.

Question **5**

Correct

Mark 1.0 out of 1.0

In the phrase “ELI the ICE man” the letter I stands for :

Select one:

- a. Voltage
- b. Energy
- c. None of these
- d. Power
- e. Current ✓

The correct answer is: Current

Correct

Marks for this submission: 1.0/1.0.

Question **6**

Correct

Mark 0.0 out of 1.0

Capacitors in series can be combined to find the total equivalent capacitance by :

Select one:

- a. Adding the capacitances together
- b. Adding the reciprocal of each capacitance together
- c. Multiplying the capacitances together
- d. None of the these
- e. Taking the reciprocal of the sum of the reciprocals of each capacitance ✓

The correct answer is: Taking the reciprocal of the sum of the reciprocals of each capacitance

Correct

Marks for this submission: 1.0/1.0. Accounting for previous tries, this gives **0.0/1.0.**

Question 7

Correct

Mark 0.0 out of 1.0

If a voltage source is applied across two resistors in series, R1 and R2, and less of the voltage appears across R1 than across R2, then :

Select one:

- a. R1 has a higher resistance than R2
- b. R1 has a lower resistance than R2 ✓
- c. None of these
- d. R1 has the same resistance as R2
- e. No way to determine

The correct answer is: R1 has a lower resistance than R2

Correct

Marks for this submission: 1.0/1.0. Accounting for previous tries, this gives **0.0/1.0.**

Question 8

Correct

Mark 1.0 out of 1.0

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

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 1.0/1.0.

Question 9

Correct

Mark 0.0 out of 1.0

The power dissipated by an ideal inductor is equal to the square of the voltage across the inductor divided by the inductance.

Select one:

- True
- False ✓

The correct answer is 'False'.

Correct

Marks for this submission: 1.0/1.0. Accounting for previous tries, this gives **0.0/1.0.**

Question 10

Correct

Mark 0.0 out of 1.0

The voltage across an ideal voltage source increases as the current through it increases.

Select one:

- True
- False ✓

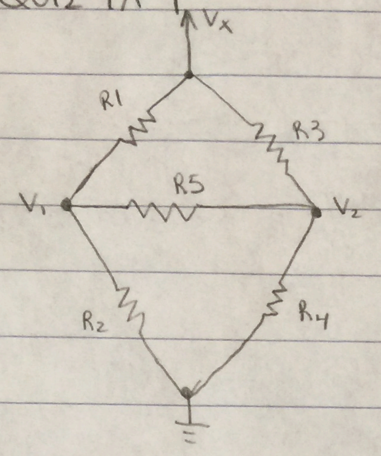
The correct answer is 'False'.

Correct

Marks for this submission: 1.0/1.0. Accounting for previous tries, this gives **0.0/1.0.**

Quiz 1A-1

4



$R1 = 4.5\,k\Omega = 4500\,\Omega$

$R2 = 8.4\,k\Omega = 8400\,\Omega$

$R3 = 5.1\,k\Omega = 5100\,\Omega$

$R4 = 7.3\,k\Omega = 7300\,\Omega$

$R5 = 7.6\,k\Omega = 7600\,\Omega$

$V_x = 3.2\,V$

Voltage across R5 in milivolts?

$$V_{th} = 3.2V\left[\frac{5.1k\Omega}{5.1+7.3} - \frac{4.5k\Omega}{4.5+8.4}\right] = 0.199968 = 0.2V$$

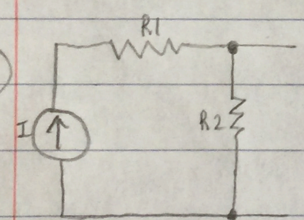
$.41129 - 0.3488$

$$R_{th} = \left(\frac{(4.5)(8.4)}{4.5+8.4} + \frac{(5.1)(7.3)}{5.1+7.3}\right) = 5.93\,k\Omega$$

$2.93 + 3.0024$

$$V_{12} = \frac{V_{th}}{R_{th}+R5} \times R5 = \frac{0.2V}{5.93k\Omega + 7.6k\Omega} \cdot 7.6k\Omega = 0.11234\ V = \boxed{112.34mV}$$

3

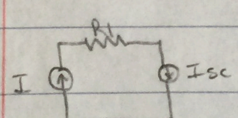


$I = 2.1mA$

$R1 = 38.1\,k\Omega$

$R2 = 45.8\,k\Omega$

Norton's Theorem Short circuit current



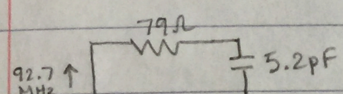
$I_{sc} = \boxed{2.1mA}$

2 Phase in degrees of the complex impedence Z

79Ω 5.2 pF @ 92.7 MHz

$R = 79\Omega$ $C = 5.2pF$ $f = 92.7MHz$

$\omega = 2\pi f = 582.45 \times 10^6$ rad/sec

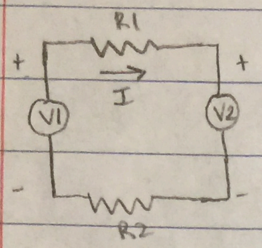


$$Z = 79\Omega - \frac{j}{(582.45\times10^6)(5.2\times10^{-12})} \rightarrow 79\Omega - \frac{j}{(582.45\cdot 5.2\times10^{-6})} \rightarrow 79 - j330.17$$

$$Z = 79 - j(330.17) \rightarrow |Z| = \sqrt{(79)^2 + (330.17)^2} = 339.48965 \approx 339.49\Omega$$

$$\theta = \arctan\left(\frac{-330.17}{79}\right) = \boxed{-76.54^\circ}$$

1



$V1 = 6.9V$

$R1 = 6.7k\Omega = 6700\Omega$

$V2 = 8.5V$

$R2 = 17k\Omega = 17000\Omega$

$$I = \frac{6.9 - 8.5}{6700 + 17000} = \frac{-1.6V}{23700\Omega} = -0.000067511\,A = \boxed{0.0675\,mA}$$

$V = IR$