Question **1**

Correct

Mark 5.00 out of 5.00

Flag question

For a two-port network to be reciprocal, it is necessary that

Select one:

a. $y_{12} = y_{21}$ and $h_{21} = -h_{12}$ ✔

b. $z_{11} = z_{22}$ and AD-BC = 0

c. $z_{11} = z_{22}$ and $y_{21} = y_{12}$

d. $h_{21} = h_{12}$ and AD-BC=0

Question **2**

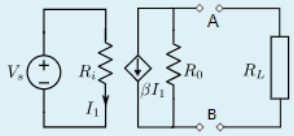
Incorrect

Mark 0.00 out of 5.00

Flag question

For the circuit shown below,

if Vs = 30 V, R_i = 20kΩ, R_o = 300kΩ and $\beta = 100 * 10^{-3}$.



Find the thevenin equivalent circuit parameters between terminals A and B. V_{th} = 45 V and R_{th} = 20 kΩ

✖

One possible correct answer is: -45, 300

Question **3**

Correct

Mark 5.00 out of 5.00

Flag question

Find the value of damping factor (ζ) for the given transfer function

TF = $\frac{3s}{(s+2)(s+4)}$

Select one:

a. 7.12

b. 0.58

c. 5.24

d. 1.06 ✔

Question **4**

Correct

Mark 2.00 out of 2.00

Flag question

The Inverse Laplace Transform (ILT) of

$\frac{(s-4)}{((s-4)^2+13^2)}$ is:

Select one:

- a. exp(4*t) x Cos(13*t) ✔
- b. exp(4*t) x Sin(13*t)
- c. exp(-4*t) x Cos(13*t)
- d. exp(-4*t) x Sin(13*t)
- e. exp(-4*t) x [Sin(13*t) + Cos(13*t)]
- f. exp(-4*t) x [Sin(13*t) - Cos(13*t)]

Question **5**

Correct

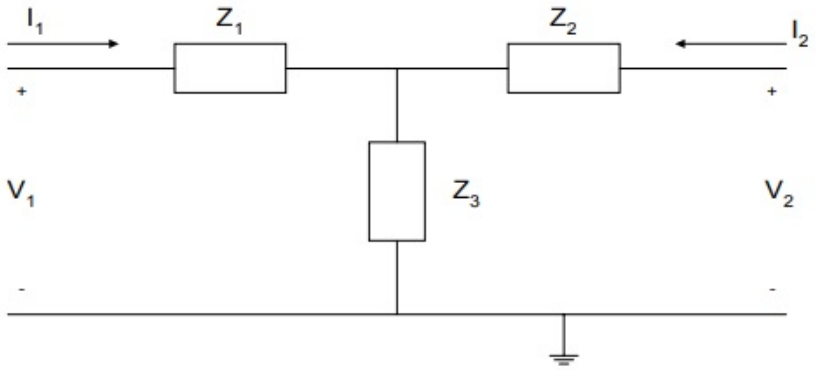
Mark 2.00 out of 2.00

Flag question

Given the following circuit with parameters (in Ohms) as follows:

$Z_1=5$; $Z_2=267$, $Z_3=84$

The impedance parameter Z_{11}(in Ohms) is:



Select one:

- a. 0.06
- b. 272.00
- c. 89.00 ✔
- d. -79.00

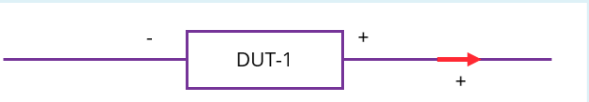
Question **6**

Correct

Mark 10.00 out of 10.00

Flag question

For the device under test (DUT) shown, voltage and current is measured with the polarity/direction as shown.



The current is 5 Amps (constant) while the voltage is $25sin(2\pi * 50 * t + (\pi))$ Volts (where t is time in seconds). The average power being delivered by this source is:

Select one:

- a. 1.25 Watts
- b. $\frac{125}{\sqrt{(2)}}$ Watts
- c. 0 Watts ✔
- d. 125 Watts

Your answer is correct.

The correct answer is: 0 Watts

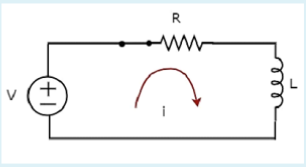
Question **7**

Incorrect

Mark 0.00 out of 5.00

Flag question

Consider the circuit as shown below, with R=60 Ohms and L=0.4 Henries. The switch is closed at time t=0. Current was zero as long as switch was open.



The applied voltage "v(t)" is sinusoidal with a frequency of 50Hz, and is given by

$v(t) = v_m \sin(\omega t)$. The steady state current is measured to be $i(t) = i_m sin(\omega t - \phi)$. The value of $\tan(\phi)$ is:

Answer: 0.0067 ✖

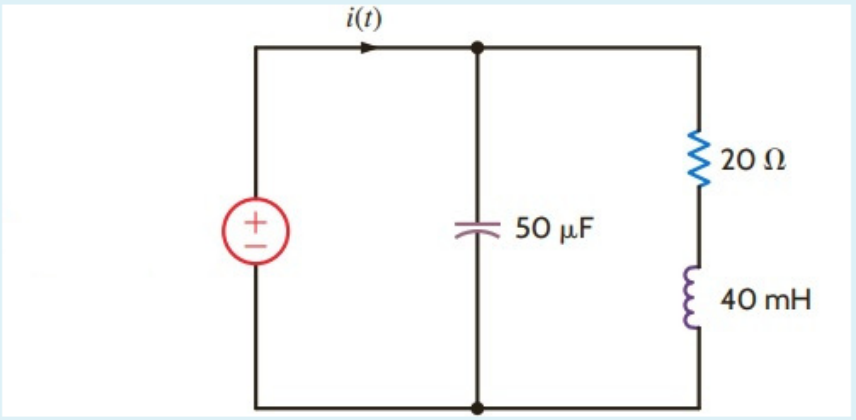
The correct answer is: 2.094

Question **8**

Partially correct

Mark 5.00 out of 15.00

Flag question



v(t) = $120\sin(377t + \frac{\pi}{3})$

The current i(t) at steady state is:

1.994 ✖ × cos(377 ✔ t− 22.68 ✖)A

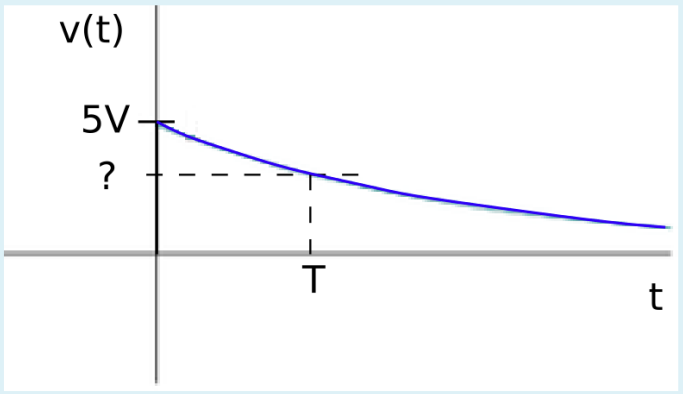
Question **9**

Incorrect

Mark 0.00 out of 10.00

Flag question

A series RC circuit is driven by a constant DC source having magnitude 5V. At t=0 the voltage across the capacitor is 0V. The voltage across the resistor is plotted below for time $t > 0$. Given that R = $10k\Omega$ and C = $2 * 100 * \pi$ Microfarads, what is T (in seconds) when $v(t) = 3032.65mV$?



Answer: 1.364 ✖

The correct answer is: 3.14

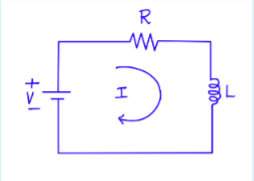
Question **10**

Not answered

Marked out of 1.00

Flag question

Consider the circuit as shown below, with V=4 volts, R=20 ohms, and L=30 Henries. The laplace-domain expression for current through the circuit, I(s) is:



Select one:

- a. 0.200 x [1/s]
- b. 0.20 x [(1/s) + (1/(s+0.67))]
- c. 0.200 x [$1/s^2$]
- d. 0.200 x [(1/s) - (1/(s+0.667))]
- e. 0.20 x [(1/s) + (1/(s^2+0.67))]

Your answer is incorrect.

The correct answer is: 0.200 x [(1/s) - (1/(s+0.667))]

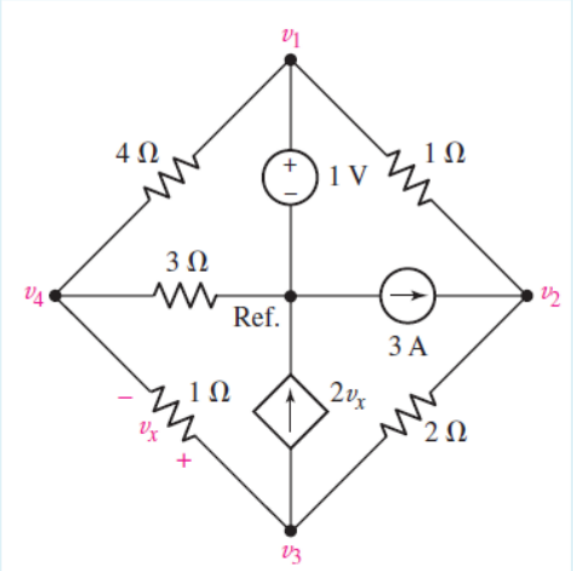
Question **11**

Partially correct

Mark 5.00 out of 20.00

Flag question

For the circuit shown in the figure. Calculate all the node voltages in Volts and enter the answer up to two decimal values.



The voltage v_1 is 1 ✔ volts

The voltage v_2 is 2.62 ✖ volts

The voltage v_3 is -1.55 ✖ volts

The voltage v_4 is -2.25 ✖ volts

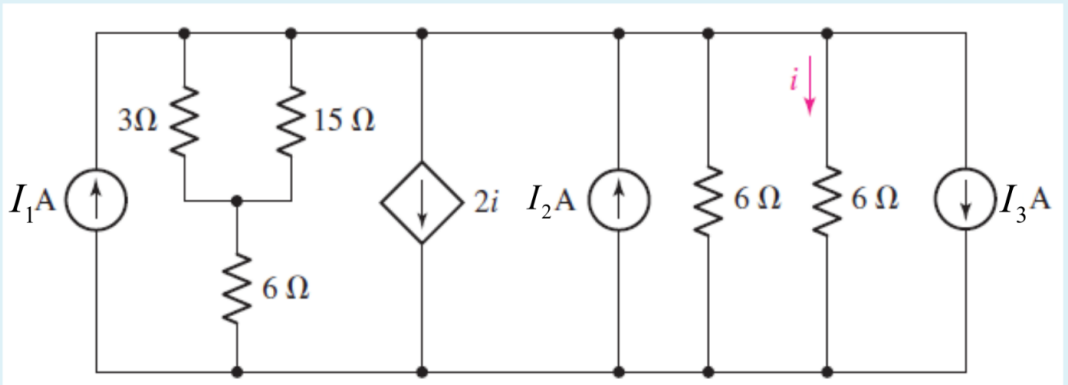
Question **12**

Correct

Mark 5.00 out of 5.00

Flag question

Calculate the current i flowing through 6 Ω resistance in the following circuit, if the values of I_1 = 5.7 Amps , I_2 = 5.7 Amps and I_3 = 1.7 Amps. Enter the current in Amperes upto two decimal values.



Answer: 2.06 ✔

The correct answer is: 2.06

Question **13**
Correct
Mark 5.00 out of 5.00
Flag question

If $v(t) = 230\sqrt{2}sin(100\pi t)$ V and $i(t) = 5 + 12\sqrt{2}sin(100\pi t - 30^0) + 9\sqrt{2}sin(300\pi t - 50^0) + 6\sqrt{2}sin(500\pi t - 70^0)$ A. Then find the value of reactive power flowing through the circuit (in VAR)

Select one:

- a. 1380 ✔
- b. 2390
- c. 1500
- d. 2450

Your answer is correct.

The correct answer is: 1380

Question **14**
Correct
Mark 5.00 out of 5.00
Flag question

A two-port device is defined by the following pair of equations : $i_1 = 2v_1 + v_2$ and $i_2 = v_1 + v_2$. Its impedence parameters $\begin{bmatrix} z_{11} & z_{12} \\ z_{21} & z_{22} \end{bmatrix}$ are given as

Select one:

- a. $\begin{bmatrix} 2 & -1 \\ -1 & 1 \end{bmatrix}$
- b. $\begin{bmatrix} 1 & -1 \\ -1 & 2 \end{bmatrix}$ ✔
- c. $\begin{bmatrix} 2 & 1 \\ 1 & 1 \end{bmatrix}$
- d. $\begin{bmatrix} 1 & 1 \\ 1 & 2 \end{bmatrix}$

Your answer is correct.

The correct answer is: $\begin{bmatrix} 1 & -1 \\ -1 & 2 \end{bmatrix}$

Question **15**
Correct
Mark 5.00 out of 5.00
Flag question

The transfer impedances at a 2-port network remains constant when the position of excitation and response are interchanged if the network

Select one or more:

- a. has high impedances
- b. is resonant
- c. is linear ✔
- d. contains bilateral elements ✔

Your answer is correct.

The correct answers are: is linear, contains bilateral elements

Question **16**

Correct

Mark 5.00 out of 5.00

Flag question

The laplace transform of

$f(t) = \sin^2(t)\cos(t)$ is:

Select one:

a. $\frac{1}{4}\left[\frac{s}{s^2+1} - \frac{3}{s^2+9}\right]$

b. $\frac{1}{4}\left[\frac{s}{s^2+1} - \frac{9}{s^2+9}\right]$

c. $\frac{1}{4}\left[\frac{s}{s^2+1} + \frac{9}{s^2+9}\right]$

d. $\frac{1}{4}\left[\frac{s}{s^2+1} - \frac{s}{s^2+9}\right]$

Your answer is correct.

The correct answer is: $\frac{1}{4}\left[\frac{s}{s^2+1} - \frac{s}{s^2+9}\right]$

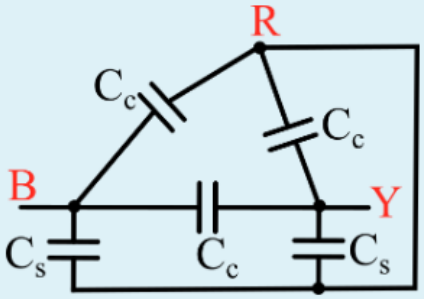
Question **17**

Correct

Mark 5.00 out of 5.00

Flag question

For the circuit shown in the figure , the capacitance measured between terminals B and Y will be



Select one:

a. $\frac{C_s+3C_c}{2}$

b. $C_s+\frac{C_c}{2}$

c. $3C_c+2C_s$

d. $C_c+\frac{C_s}{2}$

Your answer is correct.

The correct answer is: $\frac{C_s+3C_c}{2}$