Question **1**

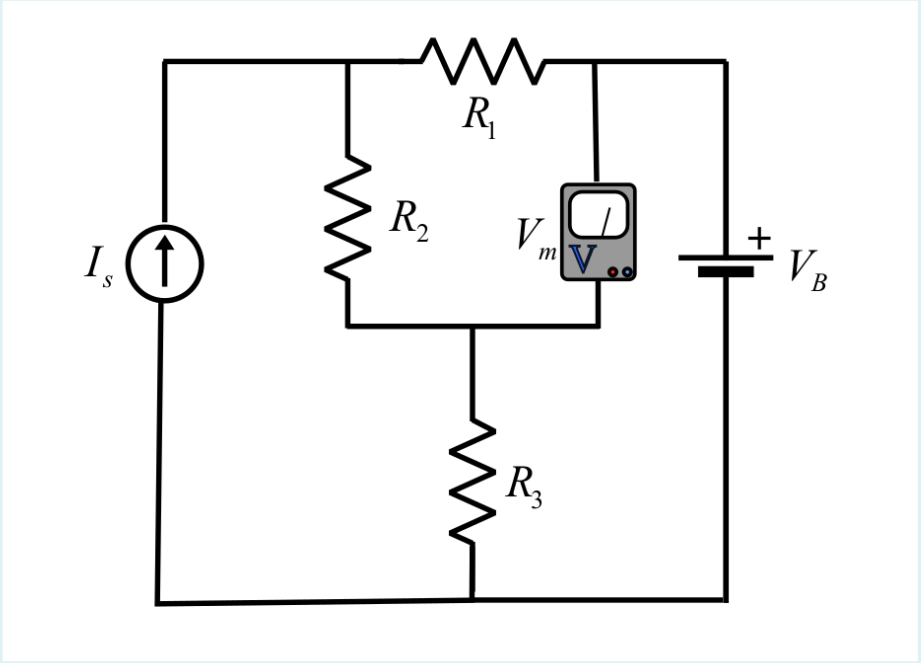
Not answered

Marked out of 15.00

Flag question

Answer this question on paper and include it in your scan. The text area below can be left blank.

For the circuit shown, the voltmeter Vm reads zero voltage. Determine the valueof Is if R1=1k, R2=1k, R3=1k and V_B = 5V



Question **2**

Correct

Mark 1.00 out of 1.00

Flag question

A voltage waveform v(t) = 12 t^2 is applied across a 1 H inductor for t>=0, with initial current through it being zero.The current through the inductor for t>=0 is given by:

Select one:

- a. $12t$
- b. $12t^3$
- c. $4t^3$ ✔
- d. $24t$

Your answer is correct.

The correct answer is: $4t^3$

Question **3**

Correct

Mark 1.00 out of 1.00

Flag question

An ideal voltage source is connected across an ideal capacitor. The capacitor voltage will reach its steady state value

Select one:

- a. in an exponentially increasing trajectory
- b. after infinite time
- c. instantaneously ✔
- d. none of these

Your answer is correct.

The correct answer is: instantaneously

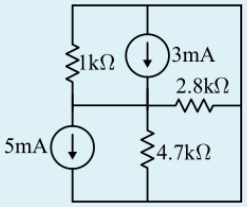
Question **4**

Incorrect

Mark 0.00 out of 1.00

Flag question

Find the power absorbed by $1K\Omega$ resistor in the circuit given below 25.908 ✖ mW.



The correct answer is: 1.623

Question **5**

Correct

Mark 1.00 out of 1.00

Flag question

The Voltage source 60 - 40u(t) V is in series with a 10Ω resistor and a 50mH inductor. Find the magnitude of the inductor voltage at t equal to 0^+

Select one:

- a. 23V
- b. 75V
- c. 80V
- d. 40V ✔

Your answer is correct.

The correct answer is: 40V

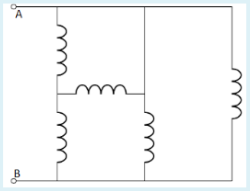
Question **6**

Incorrect

Mark 0.00 out of 1.00

Flag question

Find the equivalent inductance (in Henries) across A and B, if the value of each inductor is 1H. Assume there is no mutual flux coupling between any of the inductors.



Answer: ✖

The correct answer is: 0.375

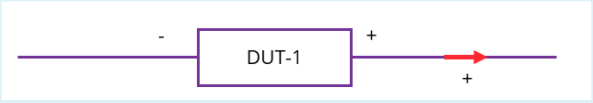
Question **7**

Incorrect

Mark 0.00 out of 1.00

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:

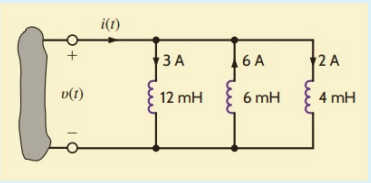
Select one:

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

Your answer is incorrect.

The correct answer is: 0 Watts

Question **8**
Correct
Mark 2.00 out of 2.00
Flag question

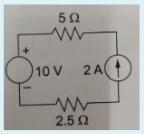


The three inductors in the circuit are assumed to be completely ideal and isolated from each other (no flux coupling between the inductors). Initial currents (at t=0) are as shown.
The three inductors can be represented by

- a single inductor with an inductance of 2 ✔ milli Henries
- with an initial current of -1 ✔ Amperes (in the direction of $i(t)$ as marked in the figure)

Question **9**
Correct
Mark 1.00 out of 1.00
Flag question

What is the total power absorbed by the resistors in the figure shown below ? 30 ✔ W



The correct answer is: 30

Question **10**
Partially correct
Mark 0.50 out of 1.00
Flag question

Select all true statements from the following:

Select one or more:

- ☑ a. A unit-step function is continuous. ✖
- ☑ b. A unit step function is finite-valued ✔
- ☐ c. A continuous function will always be differentiable.
- ☑ d. The integral of a unit impulse over all time (-inf to +inf) is one. ✔

Your answer is partially correct.

You have selected too many options.
The correct answers are: A unit step function is finite-valued, The integral of a unit impulse over all time (-inf to +inf) is one.

Question **11**
Correct
Mark 1.00 out of 1.00
Flag question

A 20 μF capacitor is connected in series with a 50 $k\Omega$ resistor and the circuit is connected to a 20V DC supply. Determine the time after connection when the resistor voltage is 15V.

Select one:

- ◉ a. 0.288 s ✔
- ○ b. 3.2 s
- ○ c. 5 s
- ○ d. 4 s

Your answer is correct.

The correct answer is: 0.288 s

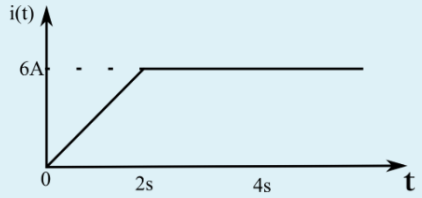
Question **12**

Correct

Mark 1.00 out of 1.00

Flag question

The current flowing through the inductor of resistance 1Ω and the inductance of 2H is shown in the figure. The energy absorbed by the inductor in the first four seconds is



Select one:

- a. 98J
- b. 168J
- c. 144 J
- d. 132J ✔

Your answer is correct.

The correct answer is: 132J

Question **13**

Not answered

Marked out of 15.00

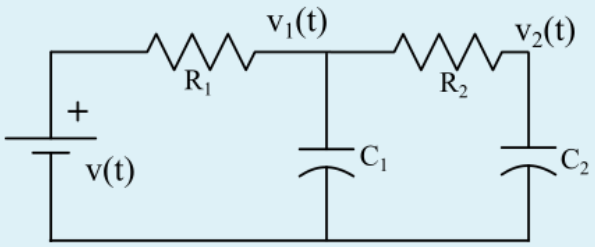
Flag question

Answer this question on paper and include it in your scan. The text area below can be left blank.

Solve the following circuit and find $V_2(t)$ (as a function of time) for all t>0. Show all steps and working.

Assume:

1. The initial conditions to be $V_1(0) = 0$ and $V_2(0) = 0$.
2. V(t) = 100V
3. C1 = 100uF
4. C2 = 10uF
5. R1 = R2 = 50 Ohms



Question **14**

Correct

Mark 1.00 out of 1.00

Flag question

Two bulbs B1 (50W, 200V) and B2 (40W, 200V) are connected in series across a 200V battery.
The total power delivered is:

Select one:

- a. 33.33W
- b. 22.22W ✔
- c. 40W
- d. 29W

Your answer is correct.

The correct answers are: 40W, 22.22W

Question **15**

Incorrect

Mark 0.00 out of 1.00

Flag question

In a source- free series RL circuit , find the numerical value of the ratio: $i(0.7\tau)/i(0)$

Select one:

- a. 0.4966
- b. 0.8934 ✖
- c. 3.7824
- d. 1.2378

Your answer is incorrect.

The correct answer is: 0.4966

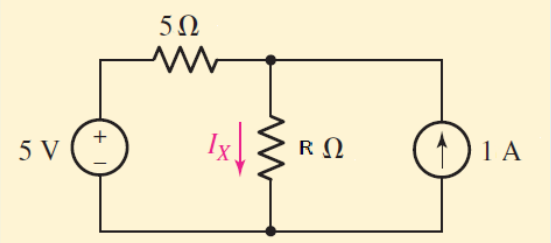
Question **16**

Correct

Mark 1.00 out of 1.00

Flag question

Calculate the current I_x in Amperes for the circuit shown in the figure, if the value of R is 1.9Ω. Enter value up to two decimal points.



Answer: 1.449 ✔

The correct answer is: 1.45

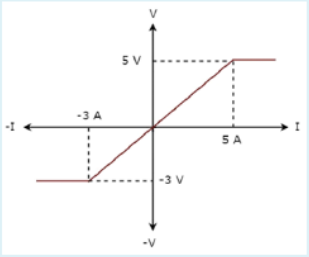
Question **17**

Partially correct

Mark 1.00 out of 2.00

Flag question

The element having the following characteristics is Linear ✖ and the type of element is bilateral ✔



Question **18**

Incorrect

Mark 0.00 out of 1.00

Flag question

The Voltage source with magnitude [60 - 40u(t)] Volts is in series with a 10Ω resistor and a 50mH inductor. Find the magnitude of the inductor current i(t) at $t = 0^-$. You may assume $i(-\infty) = 0$.

Select one:

- a. 35A
- b. 18A ✖
- c. 22A
- d. 6A

Your answer is incorrect.

The correct answer is: 6A

Question **19**

Not answered

Marked out of 15.00

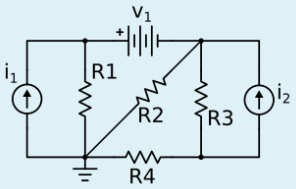
Flag question

Answer this question on paper and include it in your scan. The text area below can be left blank.

For the given network, identify and label all the nodes as $A, B, C \cdots$. Then use circuit laws to develop the circuit equations and write them in matrix form, i.e.:

$$\mathbb{A}\begin{bmatrix} v_A \\ v_B \\ v_C \\ \vdots \end{bmatrix} = \mathbb{C}$$

Where node voltages are stacked into a column vector and circuit parameters are elements of matrices $\mathbb{A}$ and $\mathbb{C}$.



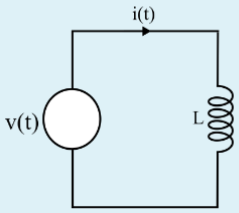
Question **20**

Correct

Mark 1.00 out of 1.00

Flag question

In the circuit shown in Figure, it is desired to have a constant direct current $i(t)$ through the ideal inductor L. The nature of the voltage source $v(t)$ must be



Select one:

- a. an ideal impulse ✔
- b. linearly increasing voltage
- c. constant voltage
- d. exponentially increasing voltage

Your answer is correct.

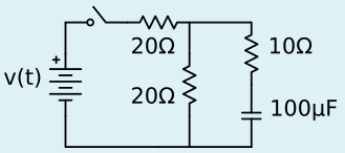
The correct answer is: an ideal impulse

Question **21**

Complete

Mark 8.00 out of 15.00

Flag question



Answer this question on paper and include it in your scan. The text area below can be left blank.

For the circuit, the switch is closed at t=0 and the capacitor is uncharged until t=0.

Determine $V_c(0^+)$,$i(0^+)$, and $V_c(t)$ for $t \geq 0$. Sketch the waveform of $V_c(t)$ before and after t=0.

Comment:

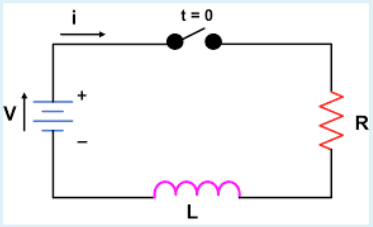
Question **22**

Correct

Mark 1.00 out of 1.00

Flag question

Given a series L-R Circuit as below, where the switch is closed at exactly t=0:



The differential equation for this system is of the form:

$$\frac{di}{dt} = a_1 v(t) - a_2 i$$

for $t > 0$ and the boundary condition is $i(0) = 0$, what are the coefficient a_1 and a_2 **respectively**?

Select one:

- a. 1 and LR
- b. R/L and 1/L
- c. LR and 1/LR
- d. L/R and L
- e. 1/L and R/L ✔
- f. 1/R and L/R
- g. L/R and 1/L

Your answer is correct.

The correct answer is: 1/L and R/L

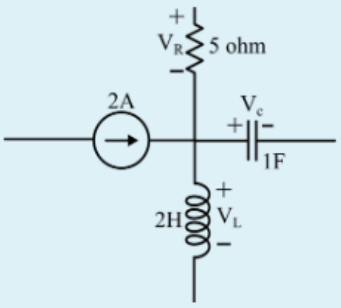
Question **23**

Incorrect

Mark 0.00 out of 1.00

Flag question

A part of a circuit is shown in the figure. $V_R = 5V$, $V_c = 4sin2t$. The voltage v_L is given by



Select one:

- a. 16 cos2t
- b. 32 sin2t
- c. 3-8cos2t ✖
- d. 16 sin2t

Your answer is incorrect.

The correct answer is: 32 sin2t

Question **24**

Not answered

Marked out of 15.00

Flag question

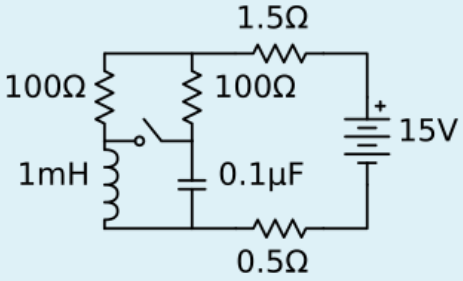
Answer this question on paper and include it in your scan. The text area below can be left blank.

For the following circuit:

A. When the switch is open:

1. Write the differential equation that describes the circuit
2. Write the characteristic equation and calculate its roots
3. What is the order of the differential equation?

B. Repeat the same for when the switch is closed.



Question **25**

Correct

Mark 1.00 out of 1.00

Flag question

The current through a 5H inductor is found to be a ramp with a slope of 5A/s. The magnitude of voltage across the inductor is 25 ✔ V.

The correct answer is: 25

Question **26**

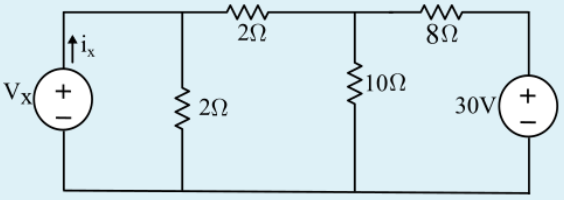
Not answered

Marked out of 15.00

Flag question

[Answer this question on paper]

Analyze the circuit below and determine the voltage v_x. Show all steps and working. You may leave the answer box blank below.



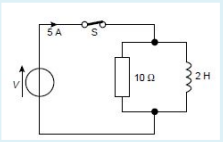
Question **27**

Correct

Mark 1.00 out of 1.00

Flag question

In the circuit shown below, a current of 5A flows from the supply at $t = 0^-$. Switch S is opened at t=0. Determine the maximum voltage magnitude appearing across the resistor



Select one:

- a. 30 V
- b. 0 V
- c. 50 V ✔
- d. 25 V

Your answer is correct.

The correct answer is: 50 V

Question **28**

Correct

Mark 1.00 out of 1.00

Flag question

Match:

A unit step function is: finite-valued ✔

If a function is differentiable it must also be continuous ✔

For all time t, the function $f(t) = \frac{1}{2}e^{-5t}$ is: differentiable ✔

Your answer is correct.

The correct answer is: A unit step function is: → finite-valued, If a function is differentiable it must also be → continuous, For all time t, the function $f(t) = \frac{1}{2}e^{-5t}$ is: → differentiable

Question **29**

Correct

Mark 1.00 out of 1.00

Flag question

An battery is found to have a voltage "E" across its terminals when no load is connected to it. When a load resistance of "R" Ohms is connected across this battery, the terminal voltage is "V". The internal resistance of the cell is:

Select one:

- $R\left(\frac{E}{V} - 1\right)$ ✔
- $2\frac{(E \cdot V)R}{E}$
- $2\frac{(E \cdot V)V}{E}$
- $(E - V)/R$

Your answer is correct.

The correct answer is: $R\left(\frac{E}{V} - 1\right)$