END SEMESTER EXAMINATIONS (JANUARY 2022) - QUESTION PAPER - PART A

(Copy)

COURSE CODE : ICE-2154
COURSE NAME : NETWORRK ANALYSIS AND SIGNALS
SEMESTER : III
DATE OF EXAM : 20/01/2022
DURATION : 45 + 3 minutes

Instructions for Students:

(1) ANSWER ALL THE QUESTIONS.
(2) EACH QUESTION CARRIES 1 MARK.
(3) YOU ARE INSTRUCTED TO INFORM THE INVIGILATOR AFTER SUBMISSION OF THIS FORM IN THE CHAT SECTION.

* Required

* This form will record your name, please fill your name.

1

STUDENT NAME: *

2

REGISTRATION NUMBER: *

The value must be a number

3

Question
(1 Point)

A LTI system has impulse response $h(t) = \delta(t-t_o)$ where t_o is a positive constant. The system is

- Causal & unstable
- Non causal & stable
- Noncausal & unstable
- Causal & stable

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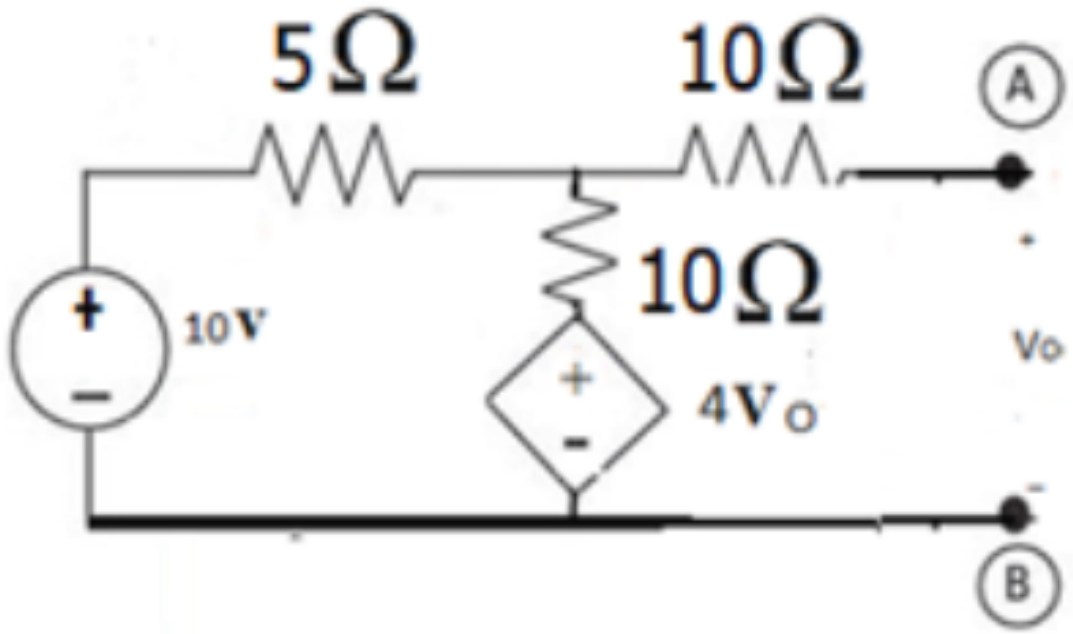
Question
(1 Point)

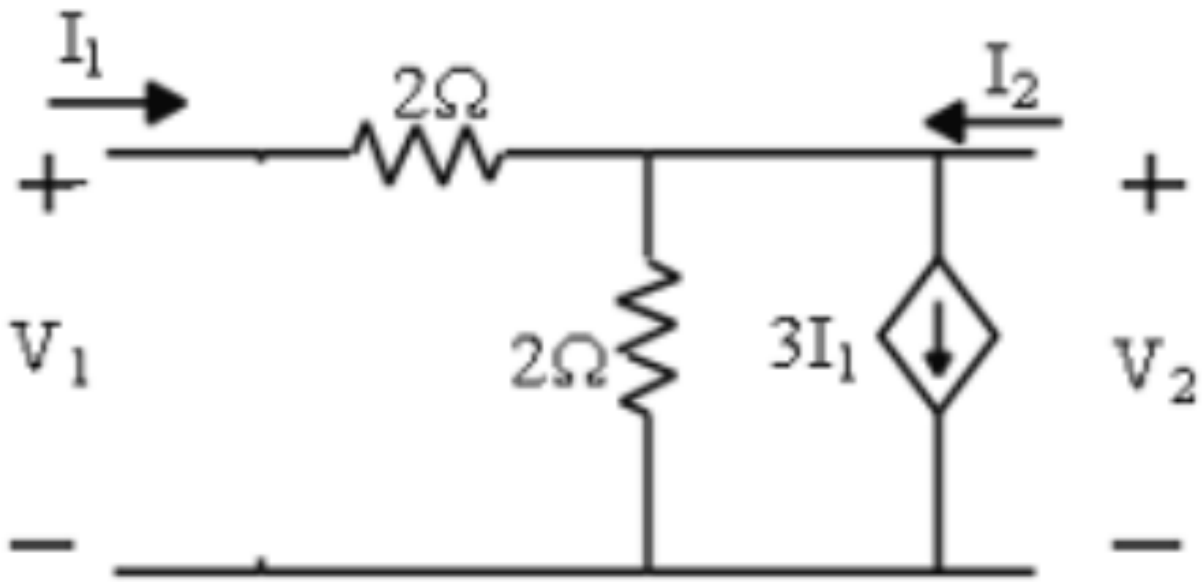
For the circuit shown, Norton's current through the terminals AB is –



- 0.5 A
- - 1 A
- 1 A
- - 0.5 A

Question
(1 Point)

For the network shown Z_{22} is



- Infinite
- Zero
- 4 Ohms
- 1 Ohm
- 2 Ohms

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Fourier series representation is used for analysis of---- signals.
(1 Point)

- both for periodic and non periodic
- Aperiodic
- periodic

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Question
(1 Point)

Signal $x(t) = u(10-t)$ is

- None of these
- All the above
- left sided
- Bounded,
- Non causal

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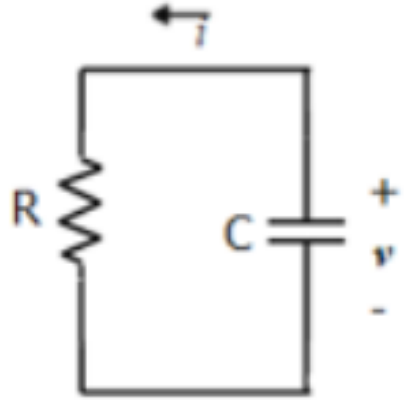
Question
(1 Point)

Signal $x(t)= (\cos (2\pi t))^2$ is --- with fundamental period—and is – signal.

- Periodic, 1 sec, Power
- Periodic, 1 sec, Energy
- Periodic, 0.5 sec, Power
- Non periodic, 0.5 sec, Power

Question
(1 Point)

For the circuit shown in figure, if $v = 20e^{-2t}$ V and $i = 0.5\,e^{-2t}$ A, determine R and C values.



- 40 Ohms, 12.5 mF
- 20 Ohms, 12.5 F
- 20 Ohms, 12.5 mF
- 20 Ohms, 12.5 micro F

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Question
(1 Point)

Two LTI systems with $h_1(t) = \delta(t + 3)$ and $h_2(t) = \delta(t - 3)$ are connected in parallel. Overall system is

- Memoryless, stable and causal system
- Memory, stable and non-causal system
- Memoryless, stable and non-causal system
- Memoryless, unstable and causal system

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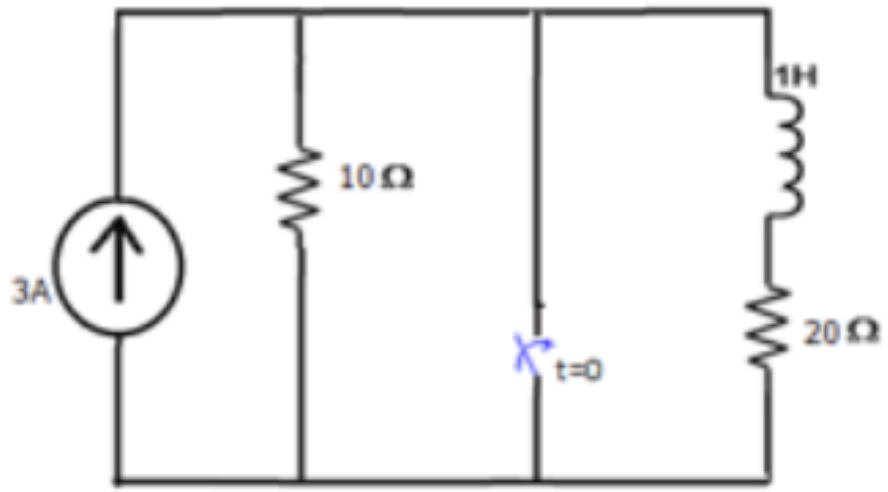
Question
(1 Point)

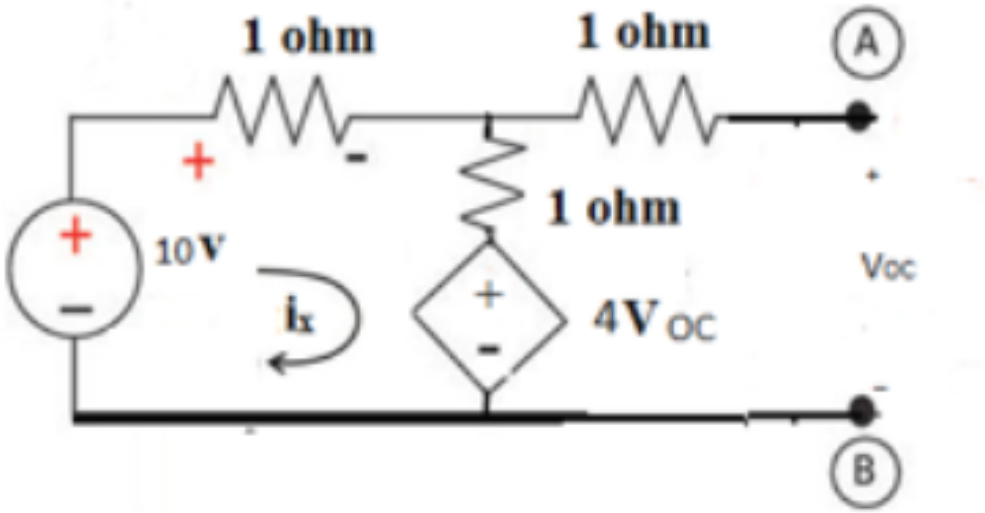
In the circuit shown in figure below switch is closed at t = 0, before which steady state has been reached. Inductor current at t = ∞ is –



- 3 A
- 0 A
- 1 A
- 2 A

Question
(1 Point)

Looking at terminals A and B, Thevenin's equivalent voltage for the circuit shown in figure below is --.



- 4 V
- 5 V
- -4 V
- -5 V

Question
(1 Point)

System $y(t) = t^2x(t)$ is

- Linear
- Non Causal
- None of these
- Time invariant
- stable

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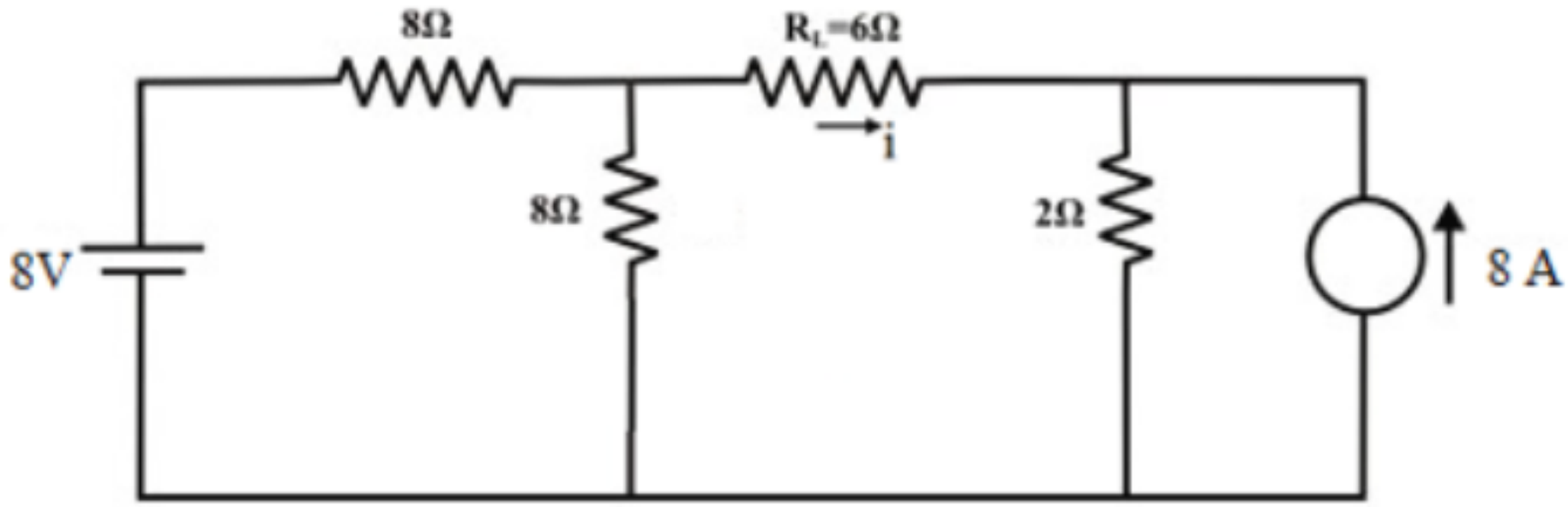
Question
(1 Point)

$$\int_{-\infty}^{\infty} (t-1)^2 \, \delta(t-1) dt =$$

- -1
- 0
- 1
- none of these

Question
(1 Point)

Current i in the circuit shown in figure is equal to ----------



- 1.67 A
- 0.167 A
- 1 A
- -1 A

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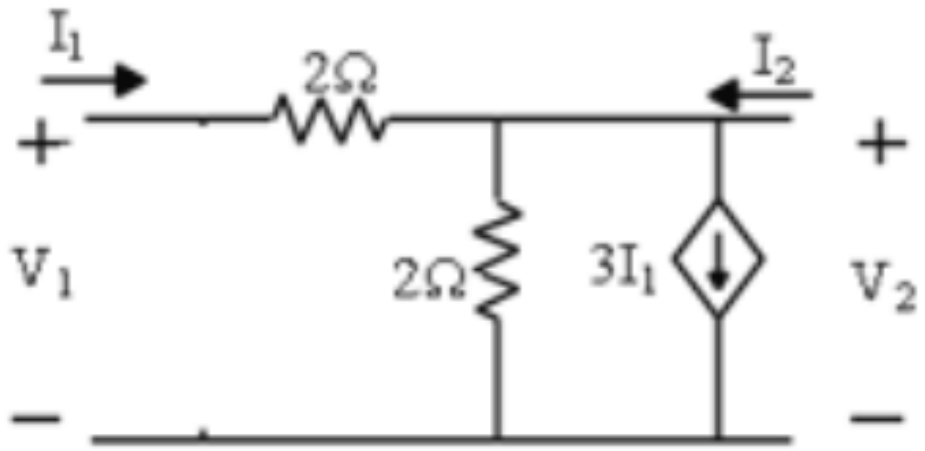
Question
(1 Point)

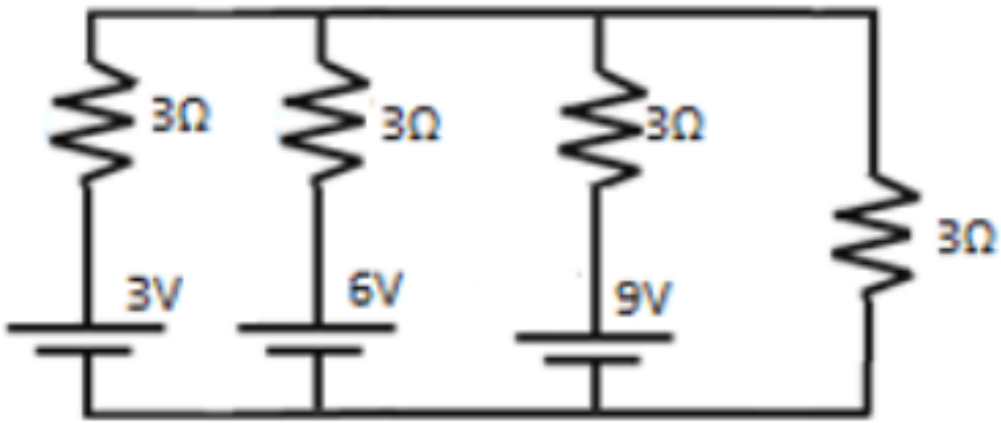
For the network shown Y_{12} is



- 0.5 S
- -4 S
- -0.5 S
- 4 S

Question
(1 Point)

For the circuit shown in figure, determine the current in load resistance of 3Ω.



- 2 A
- 1.5 A
- 1 A
- 3 A

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Question
(1 Point)

What is the function value x(0) if $X(s) = \frac{s+4}{(s+1)(s+2)}$

- 1
- 2
- Infintte
- 0

Question
(1 Point)

Fourier transform of $x(t) = e^{-2(t-1)}u(t-1)$ is

(1) $X(j\omega) = \frac{e^{j2\omega}}{2+j\omega}$

(2) $X(j\omega) = \frac{1}{2+j(\omega-1)}$

(3) $X(j\omega) = \frac{e^{-j\omega}}{2+j(\omega-1)}$

(4) $X(j\omega) = \frac{e^{-j\omega}}{2+j\omega}$

- 3
- 1
- 2
- None of these
- 4

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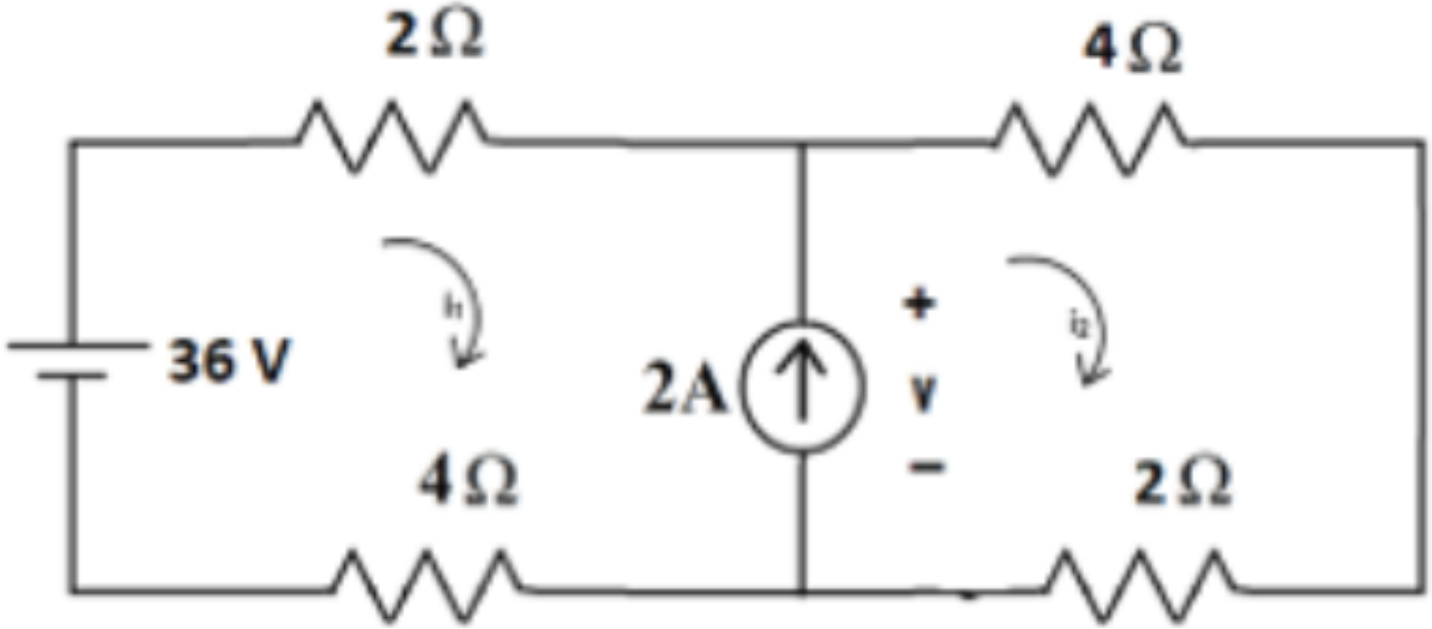
Question
(1 Point)

In the circuit shown, voltage V across 2A current source is ---



- 24 V
- 28 V
- 32 V
- 12 V

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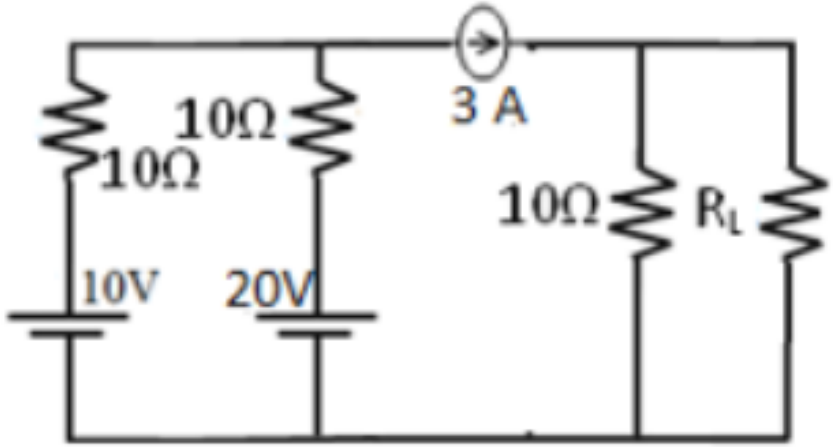
Question
(1 Point)

Sequence $x(n) = (-1)^{n^2}$

- unbounded
- right sided
- None of these
- All the above
- left sided

Question
(1 Point)

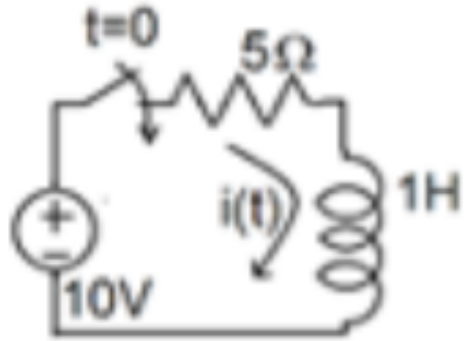
For the network shown in figure, determine the current through $R_L = 20\Omega$ resistor.



- 0 A
- 1 A
- 2 A
- 1.5 A

Question
(1 Point)

. Expression for current i(t) for the circuit shown in figure is

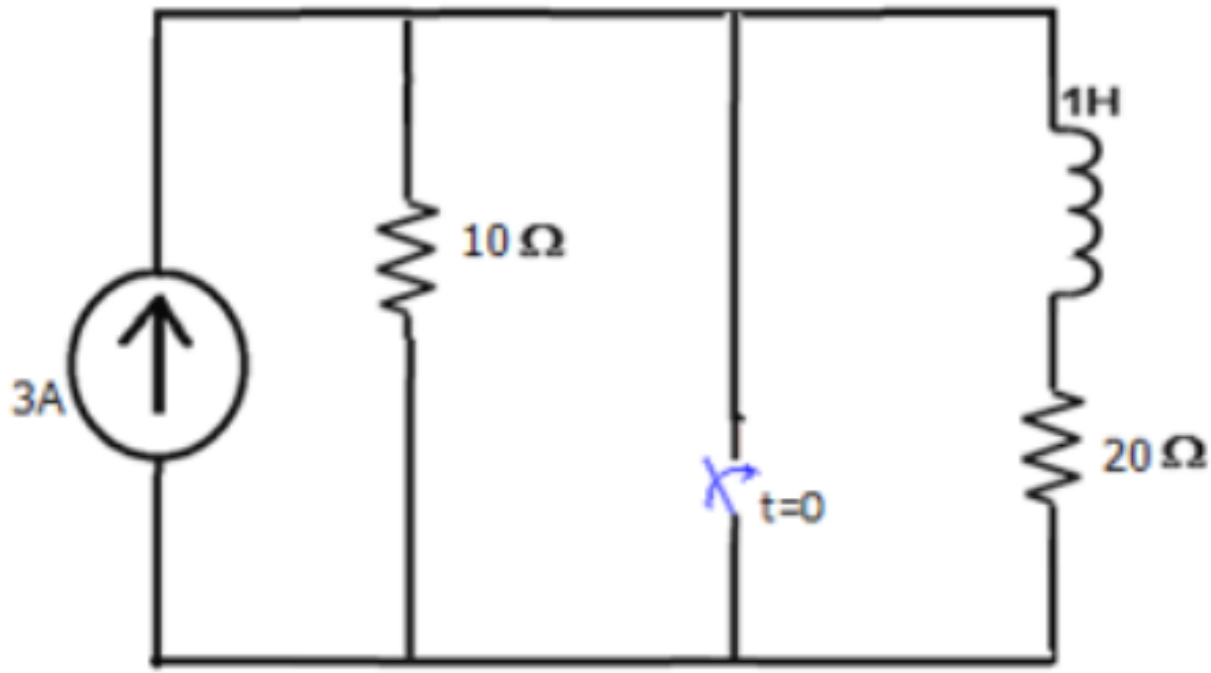


(1) $2e^{-5t}$ (2) $2\left(1-e^{-5t}\right)$ (3) $2e^{-0.2t}$ (4) $2\left(1-e^{-0.2t}\right)$

- 4
- 1
- 2
- 3

Question
(1 Point)

. In the circuit shown in figure below switch is closed at t = 0, before which steady state has been reached. Current in 10Ω resistor at t = 0+ is –



- 0 A
- 3 A
- 2 A
- 1 A

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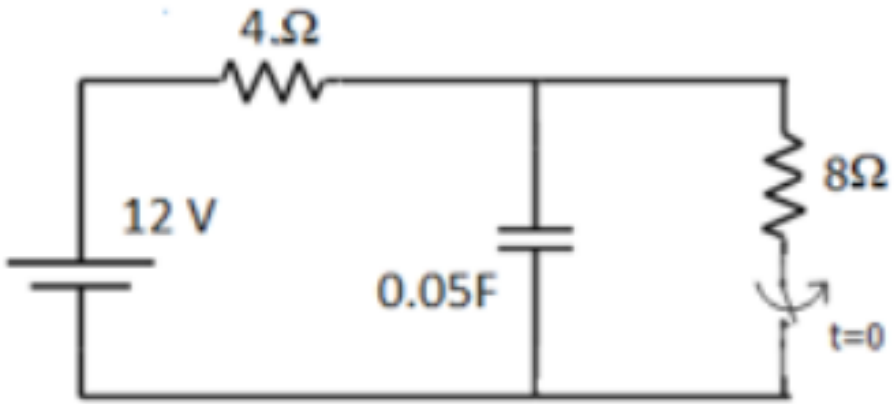
Question
(1 Point)

In the circuit shown in figure below, switch is opened at t = 0, before which steady state has been reached. Capacitor voltage at t = 0+ is –



- 4 V
- 0 V
- 8 V
- 12 V

Question
(1 Point)

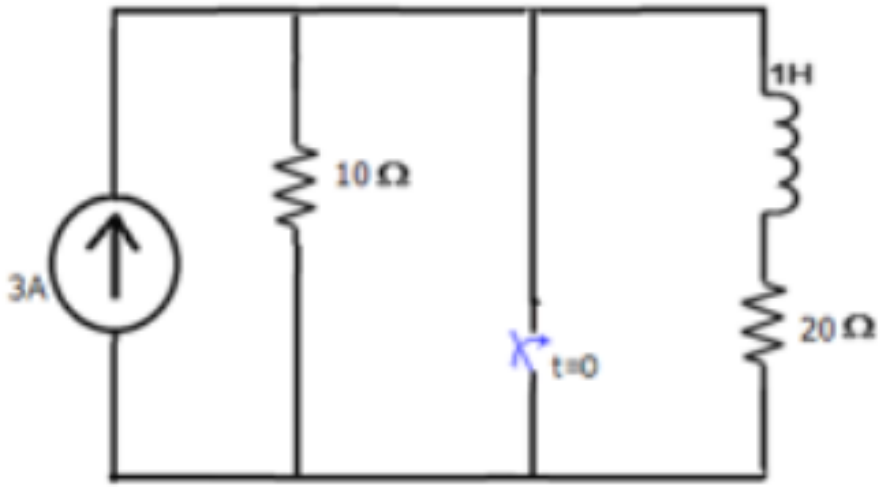
$$\sum_{k=-\infty}^{\infty} \frac{\sin^2 k\pi/4}{k^2} =$$

(1) $\frac{\pi^2}{8}$ (2) $\frac{\pi^2}{4}$ (3) $\frac{1}{8}$ (4) $\frac{1}{4}$

- 1
- 3
- 4
- 2

Question
(1 Point)

In the circuit shown in figure below switch is closed at t = 0, before which steady state has been reached. Inductor current at t = 0+ is –



- 3 A
- 2 A
- 0 A
- 1 A

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Question
(1 Point)

What is the function value x(∞) if $X(s) = \frac{s+4}{s^3+3s^2+s}$

- Infinite
- None of these
- 4
- 0

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Question
(1 Point)

Which one of the following is the signal corresponding to

$a_k = |k| \qquad -3 \leq k \leq 3 \quad ; \quad \omega_0 = \pi$

(1) $3\cos(3\pi t) + 2\cos(2\pi t) + 1\cos(\pi t)$

(2) $6\cos(3\pi t) + 4\cos(2\pi t) + 2\cos(\pi t)$

(3) $6\cos(3\pi t) + 4\cos(2\pi t) + 2\cos(\pi t) + 1$

(4) $6\sin(3\pi t) + 4\sin(2\pi t) + 2\sin(\pi t)$

- 4
- 1
- 3
- 2

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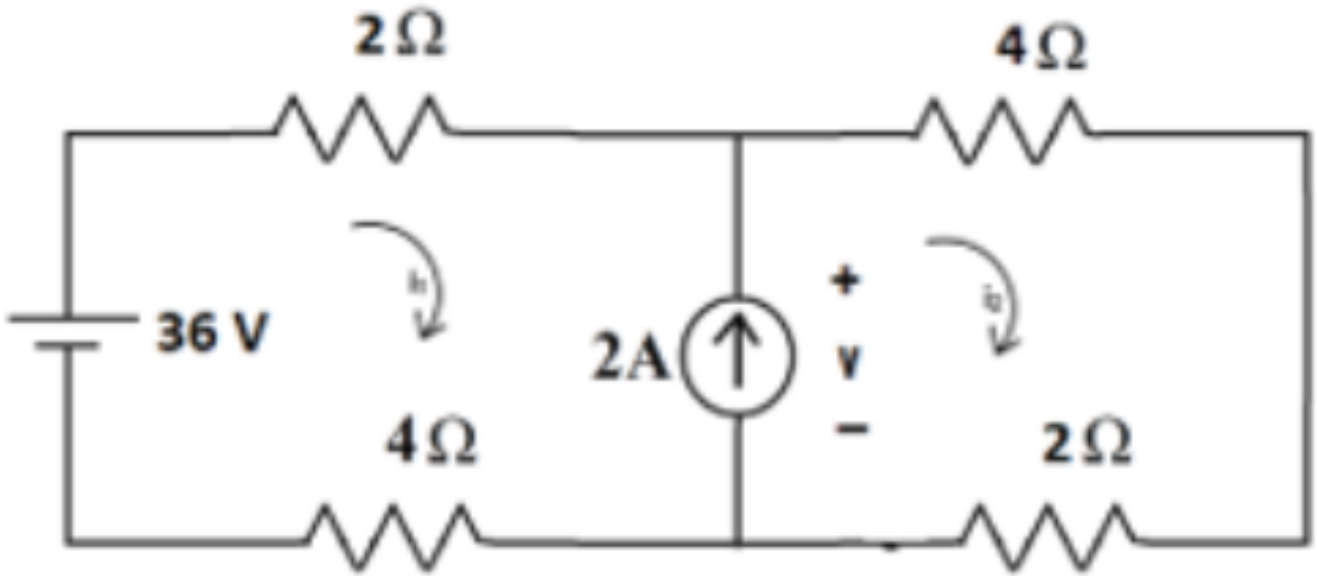
Question
(1 Point)

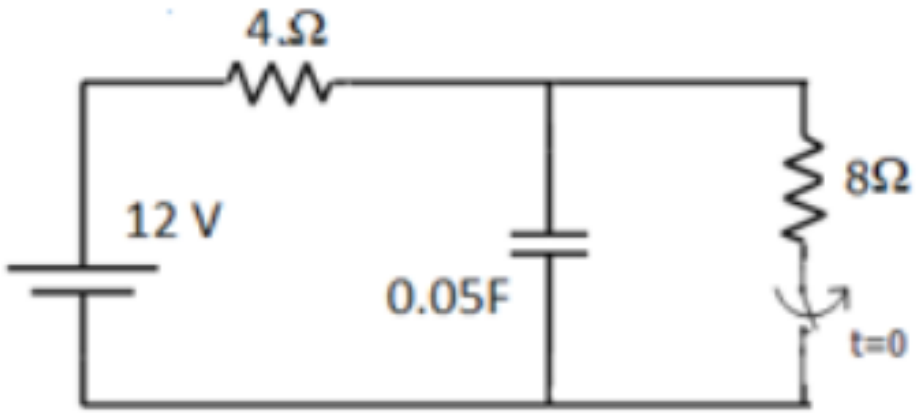
Current i_1 in the circuit shown in figure is ---



- 1 A
- 4 A
- 2 A
- -1 A

Question
(1 Point)

In the circuit shown in figure below, switch is opened at t = 0, before which steady state has been reached. Capacitor voltage at t = ∞ is –



- 12 V
- 4 V
- 8 V
- 0 V

Question
(1 Point)

The fundamental period of a discrete time complex exponential sequence is

1. $\frac{2\pi}{\omega_0}$ 2. $\frac{\omega_0}{2\pi}$ 3. $2\pi\omega_0 m$ 4. $\frac{2\pi m}{\omega_0}$

- ◯ 4
- ◯ 1
- ◯ 2
- ◯ 3