Unit 9 - Week 7

Week 7 Assignment 7

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-09-18, 23:59 IST.

1) The circuit shown in Fig.1 is in steady state when the switch S is closed at $t=0$. Assuming that the inductance is ideal, the currents through the switch and the inductor at $t=0^+$ are equal to *1 point*

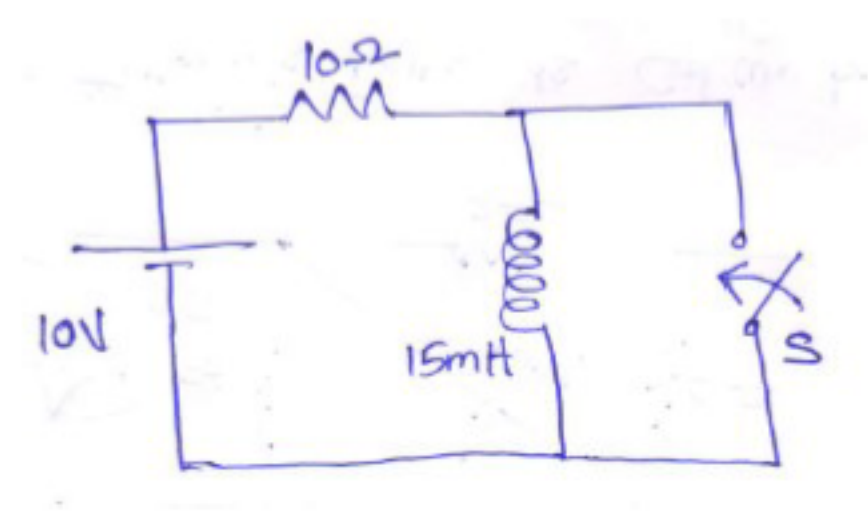

Fig. 1

a. 0 amp through the switch and 1 amp through the inductor
b. 0 amp through the switch and 0 amp through the inductor
c. 1 amp through the switch and 1 amp through the inductor
d. 1 amp through the switch and 0 amp through the inductor

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

2) The switch in the circuit shown Fig. 2 was on position a for a long time and is moved to position b at time $t=0$. The current $i(t)$ for $t>0$ is given by *1 point*

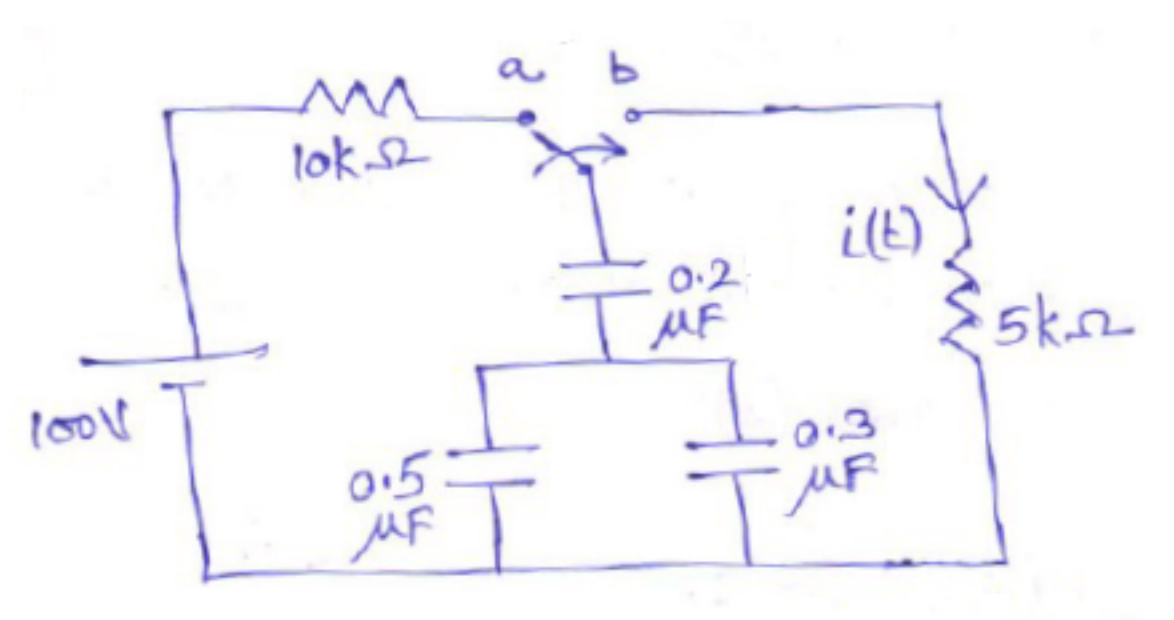

Fig. 2

a. $0.2e^{-125t}$ u(t) mA
b. $20e^{-1250t}$ u(t) mA
c. $0.2e^{-1250t}$ u(t) mA
d. $20e^{-1000t}$ u(t) mA

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

3) The initially relaxed RC-series network with R=2MΩ and C=1μF is switched on to a 10V step input. The voltage across the capacitor after 2 seconds will be *1 point*

a. Zero
b. 3.68 V
c. 6.32 V
d. 10 V

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

4) *1 point*

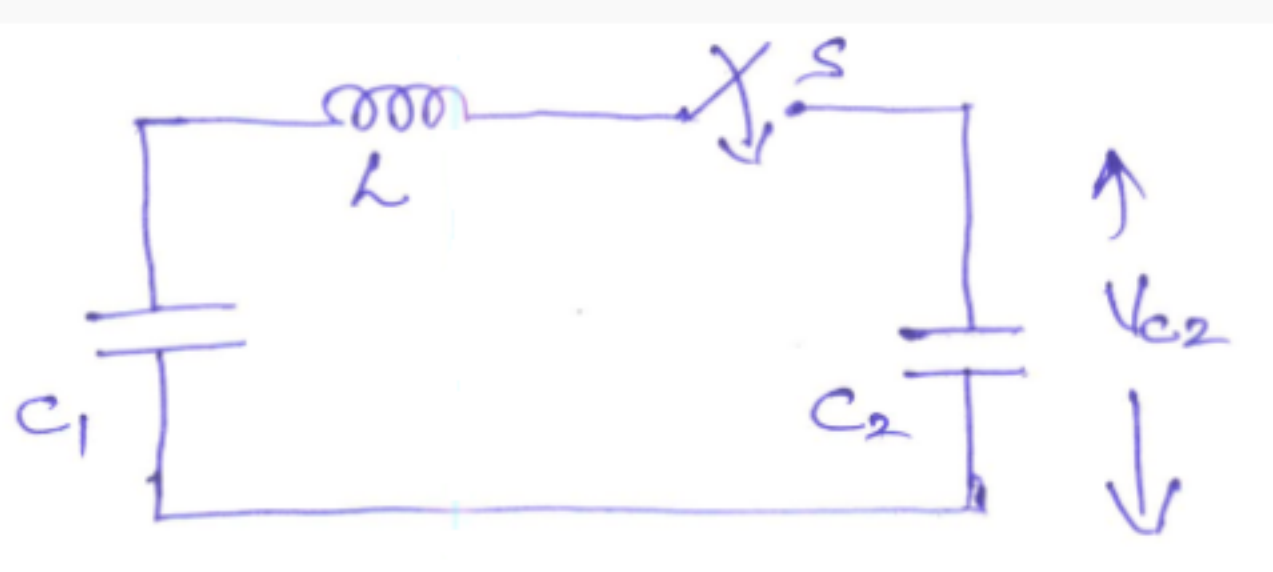

Fig. 3

In the circuit shown in Fig. 3; $C_1 = C_2 = 2F$ and the capacitor C_1 has a voltage of 20V when S is open. If the switch S is closed at $t=0$, the voltage V_{c2} will be a

a. Fixed voltage of 20V
b. Fixed voltage of -20V
c. Fixed voltage of 10V
d. Sinusoidal voltage

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

5) The response of an initially relaxed linear circuit to a signal V_s is e^{-2t}u(t). If the input signal is changed to $V_s + 2\frac{dV_s}{dt}$, the response will be *1 point*

a. $-4e^{-2t}$ u(t)
b. $-3e^{-2t}$ u(t)
c. $4e^{-2t}$u(t)
d. $5e^{-2t}$ u(t)

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

6) The first order differential equation given by $\frac{dx(t)}{dt} + \frac{x(t)}{\tau} = A,$ with constant forcing function will have solution which of the following form; *1 point*
where $A\tau$ *and* τ refers to steady state solution and time constant respectively.

a. $x(t) = A\tau + Ke^{-t/\tau}$
b. $x(t) = \frac{A}{\tau} + Ke^{-t/\tau}$
c. $x(t) = A\tau + Ke^{t/\tau}$
d. $x(t) = \frac{A}{\tau} + Ke^{t/\tau}$

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

7) The response of a network is $i(t) = Kte^{-\alpha t}$ *for* $t \geq 0$, where α is real positive. The value of t at which the $i(t)$ will be maximum is *1 point*

a. α
b. 2α
c. $\frac{1}{\alpha}$
d. α^2

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
c.

8) In the circuit shown in Fig. 4, the ideal switch S is open for long time. If it is closed at $t=0$; then the expression for current $i(t)$ in the circuit shown *1 point*

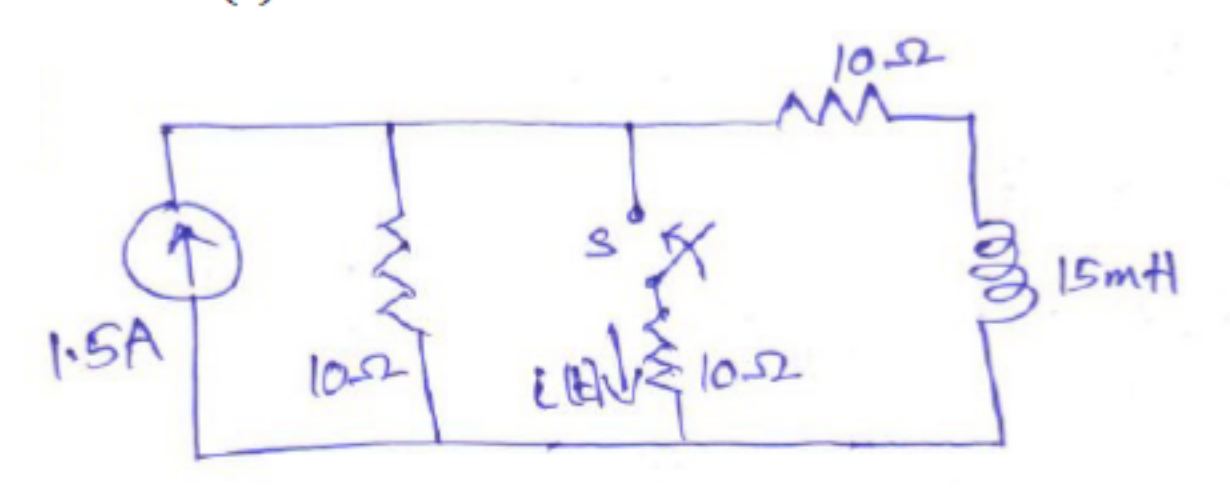

Fig. 4

a. $0.5 - 0.125e^{-1000t}$ A
b. $1.5 - 0.125e^{-1000t}$ A
c. $0.5 - 0.5e^{-1000t}$ A
d. $1.5 - 0.375e^{-1000t}$ A

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

9) In the circuit shown in Fig. 5, the switch S is closed at $t=0$. The rate of change of current $\frac{di(0^+)}{dt}$ is given by? *1 point*

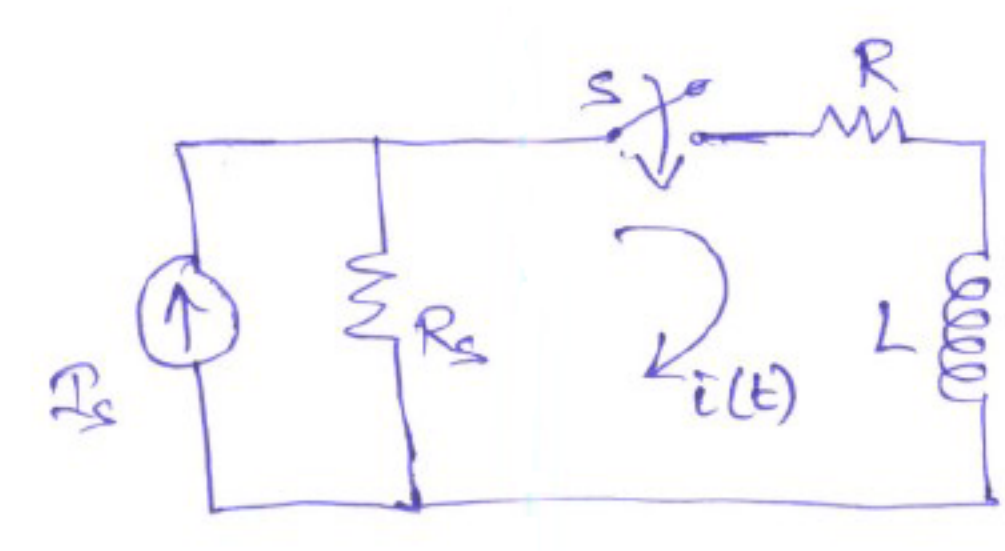

Fig. 5

a. 0
b. $\frac{R_S I_S}{L}$
c. $\frac{(R+R_S)I_S}{L}$
d. Infinity

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.

10) In the circuit shown in Fig. 6, the ideal switch is open for long time. If it is closed at $t=0$; then the magnitude of current in (mA) through the 4kΩ resistor at $t=0^+$ is. *1 point*

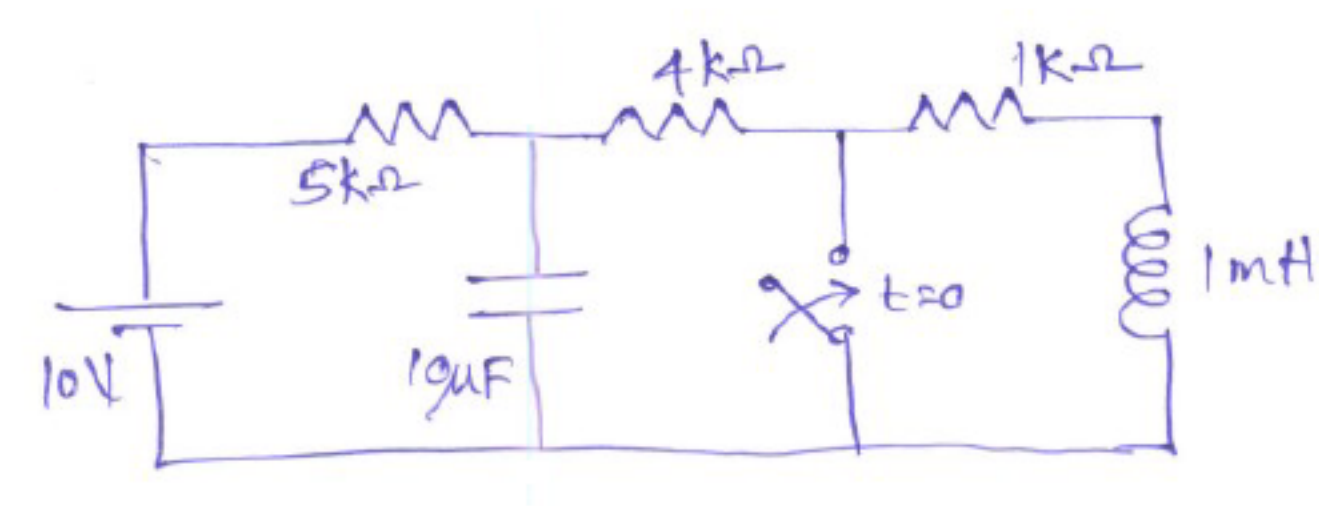

Fig. 6

a. 1.25
b. 1.35
c. 1.45
d. 1.55

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.

11) The switch in circuit shown in Fig. 7 has been in position *1* for a long time and abruptly changes to position *2* at $t=0$. If the time t is in seconds, the capacitor voltage V_c in volts for $t>0$ is given by? *1 point*

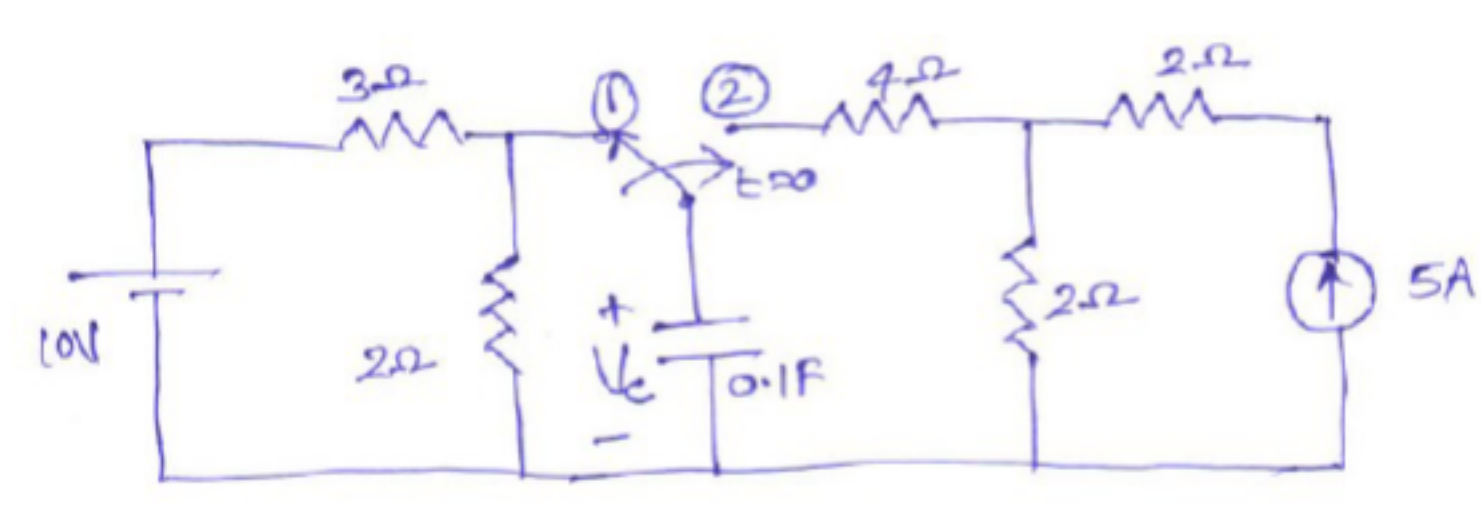

Fig. 7

a. $4(1 - e^{-\frac{t}{0.5}})$
b. $10 - 6e^{-\frac{t}{0.5}}$
c. $4\left(1 - e^{-\frac{t}{0.6}}\right)$
d. $10 - 6e^{-\frac{t}{0.6}}$

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

12) The time constant of the network shown in Fig. 8 is *1 point*

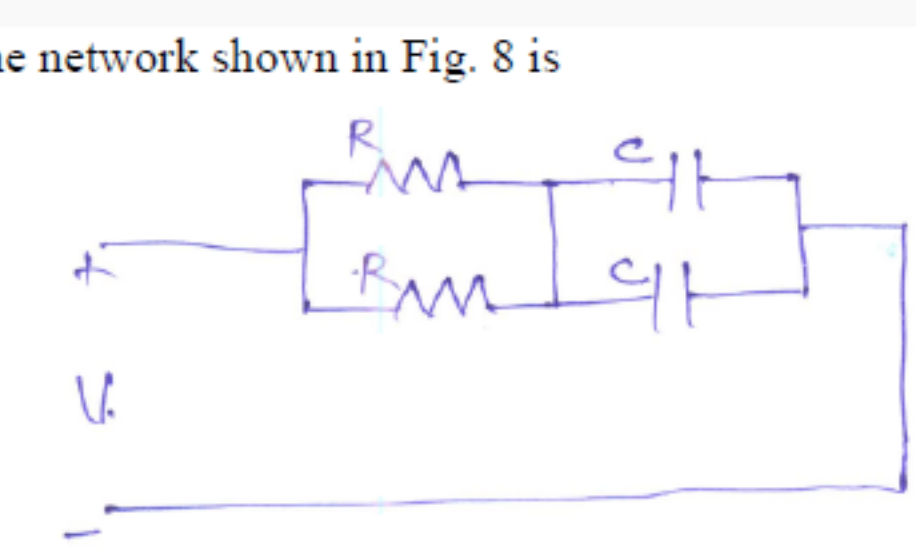

Fig. 8

a. RC
b. 2RC
c. 0.5RC
d. 0.25RC

- a.
- b.
- c.
- d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
a.