X

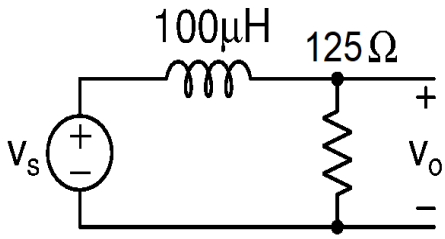
Unit 11 - Week 9 :First Order Circuits

Assignment 9

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

Due on 2020-11-18, 23:59 IST.

1)



The circuit above obeys the following differential equation. Determine the parameter τ.

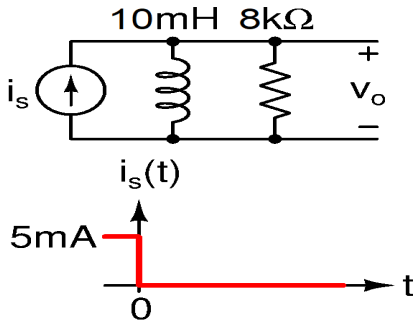
$$\tau\frac{dv_o}{dt} + v_o = v_s(t)$$

(The answer must be **the value of τ in microseconds** (μs). Round off fractional answers to 1 decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 0.7,0.9

1 point

2)



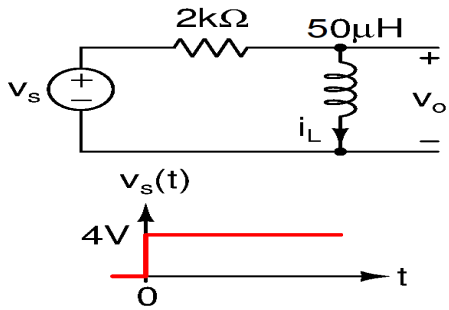
In the circuit above, the current source i_s jumps from $5\,mA$ to zero at $t = 0$ as shown. At $t = 0^-$, the inductor current is 5 mA. Determine the power dissipated in the resistor at $t = 2\,\mu s$.

(The answer must be **in milliwatts (mW)**. Round off fractional answers to 1 decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 8.1,8.3

1 point

3)



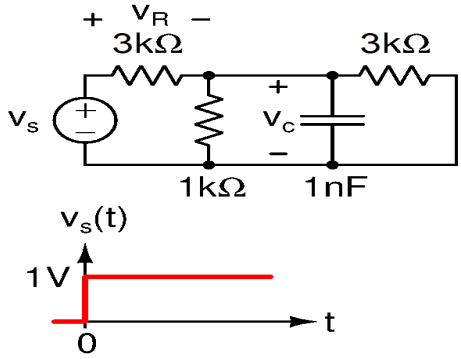
In the circuit above, $i_L(0^-) = -2$ mA. v_s jumps from zero to 4 V as shown. Determine the time $t_0 > 0$ at which the power dissipated in the resistor is minimum (Hint: To do this, determine $i_L(t)$ for $t > 0$, sketch it, and determine the answer instead of blindly deriving the expression, differentiating, etc.).

(The answer must be **in nanoseconds (ns)**. Round off fractional answers to 1 decimal place.)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 17.1,17.5

1 point

4)



In the circuit above, $v_c(0^-) = 1$ V. v_s jumps from zero to 1 V at $t = 0$ as shown. Determine $v_R(1\,\mu s)$.

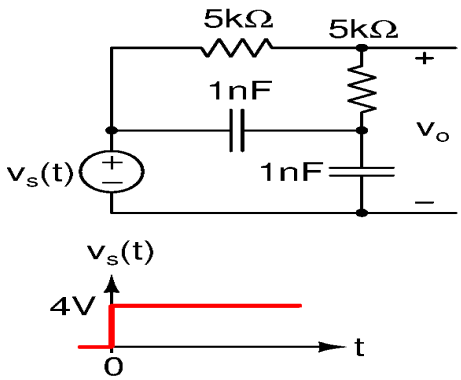
(The answer must be **in millivolts (mV)**. Round off fractional answers to 1 decimal place.)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 647,651

1 point

5)



In the circuit above, both capacitors have zero charge on them at $t = 0^-$. v_s jumps from zero to 4 V at $t = 0$. Determine $v_o(10\,\mu s)$.

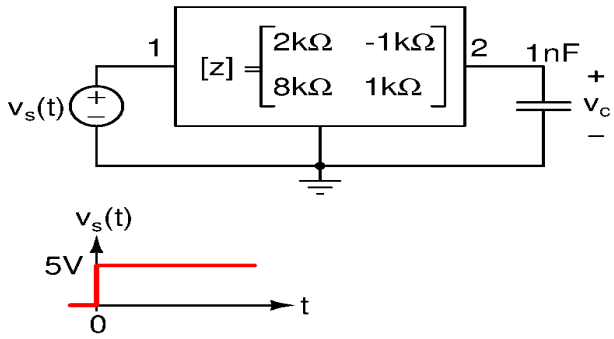
(The answer must be **in volts (V)**. Round off fractional answers to 1 decimal place.)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 3.3,3.5

1 point

6)



In the circuit above, the capacitor is initially discharged. Determine the time constant and the final value of v_c. (This circuit may look different from the others you have seen in this unit, but it is solved using exactly the same general principles: (a) Finding values at 0^+, ∞ and the time constant, or (b) Writing down the differential equation in terms of v_c.)

Time constant τ

(The answer must be **in microseconds** (μs). Round off fractional answers to 1 decimal place.)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 4.8,5.2

1 point

7)

In question 6 above,

Final value of v_c

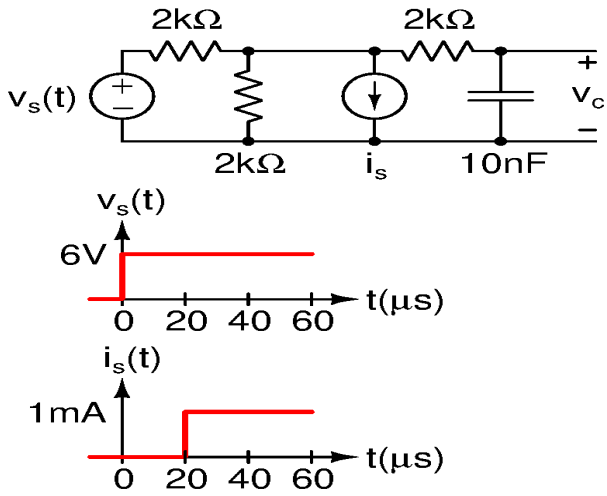
(The answer must be **in volts** (V). Round off fractional answers to 1 decimal place.)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 19.8,20.2

1 point

8)



In the circuit above, the capacitor is initially discharged. v_s and i_s are as shown. Determine $v_c(40\,\mu s)$.

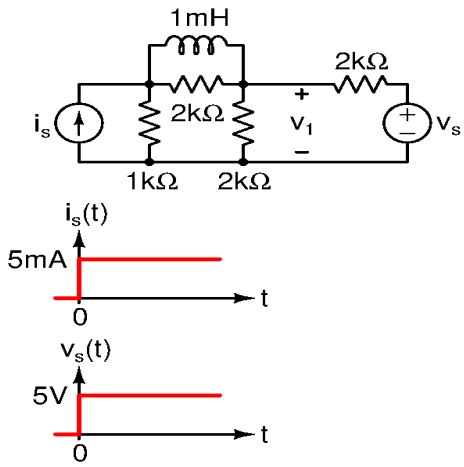
(The answer must be **in volts (V)**. Round off fractional answers to 1 decimal place.)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 1.6,1.8

1 point

9)



In the circuit above, the inductor has zero initial conditions. Determine $v_1(2\,\mu s)$.

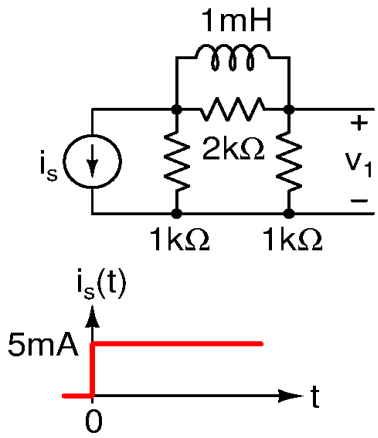
(The answer must be **in volts (V)**. Round off fractional answers to 1 decimal place.)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 3.6,3.8

1 point

10)



In the circuit above, the inductor has zero initial conditions. Determine $v_1(2\,\mu s)$.

(The answer must be **in volts (V)**. Round off fractional answers to 1 decimal place.)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) -2.4,-2.2

1 point