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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » Basic Electrical Circuits (course)

Announcements (announcements) About the Course (preview) Ask a Question (forum) Progress (student/home) Mentor (student/mentor)

Unit 3 - Week 1: Preliminaries; Current and voltage; Electrical elements and circuits; Kirchhoff's laws; Basic elements; Linearity

Course outline

How does an NPTEL online course work?

Week 0

Week 1: Preliminaries; Current and voltage; Electrical elements and circuits; Kirchhoff's laws; Basic elements; Linearity

- Preliminaries (unit? unit=23&lesson=28)
- Current (unit? unit=23&lesson=30)
- Voltage (unit? unit=23&lesson=29)
- Electrical elements and circuits (unit? unit=23&lesson=31)
- Kirchhoff's current law(KCL) (unit?unit=23&lesson=33)
- Kirchhoff's voltage law(KVL) (unit?unit=23&lesson=34)
- Voltage source (unit? unit=23&lesson=35)
- Current source (unit? unit=23&lesson=36)
- Resistor (unit? unit=23&lesson=37)
- Capacitor (unit? unit=23&lesson=38)
- Inductor (unit? unit=23&lesson=39)
- Mutual inductor (unit? unit=23&lesson=40)
- Linearity of elements (unit? unit=23&lesson=41)
- Week 1 Lecture Material (unit?unit=23&lesson=181)
- Quiz : Assignment 1 (assessment?name=189)**
- Basic Electrical Circuits : Week 1 Feedback Form (unit?unit=23&lesson=194)
- Assignment 1 solutions (unit? unit=23&lesson=210)

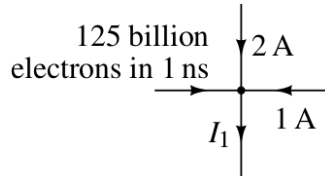
Week 2: Elements in series and parallel; Controlled sources

Assignment 1

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

Due on 2020-09-30, 23:59 IST.

1)



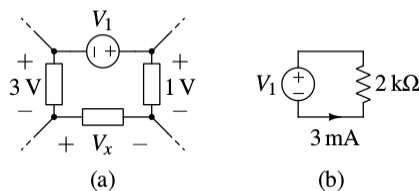
In the circuit above, determine I_1 . Use magnitude of electronic charge = $1.6 \times 10^{-19} C$

(The answer must be in **amperes (A)**. Round off fractional answers to two decimal places.)

No, the answer is incorrect. Score: 0
Accepted Answers: (Type: Numeric) -17

1 point

2)



In the figure above, determine the voltage V_x in (a). The voltage source V_1 is such that when it is connected to a $2k\Omega$ resistor, a current flows as shown in (b).

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

No, the answer is incorrect. Score: 0
Accepted Answers: (Type: Numeric) 4

1 point

Week 3: Power and energy in electrical elements; Circuit analysis methods

Week 4: Nodal analysis

Week 5 : Mesh analysis; Circuit theorems

Week 6: More circuit theorems; Two port parameters

Week 7: Two port parameters continued; Reciprocity in resistive networks

Week 8: Opamp and negative feedback; Example circuits and additional topics

Week 9 :First Order Circuits

Week 10 : First order circuits with time-varying inputs

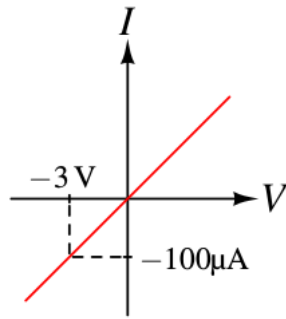
Week 11: Second order system response

Week 12: Direct calculation of steady state response from equivalent components

Text Transcripts

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3)



A resistor's I - V characteristics are shown in the figure above. Determine its resistance.

(The answer must be in **kilohms (kΩ)**. Round off fractional answers to two decimal places.)

No, the answer is incorrect.

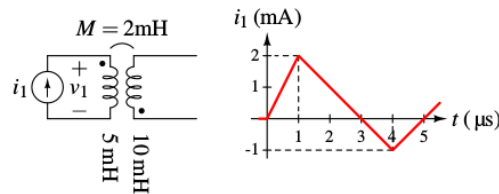
Score: 0

Accepted Answers:

(Type: Numeric) 30

1 point

4)



In the figure above, determine the voltage v_1 at $t=3 \mu s$. (The waveform consists of straight line segments)

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

No, the answer is incorrect.

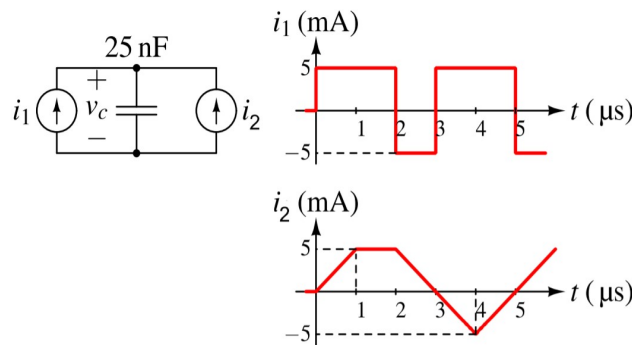
Score: 0

Accepted Answers:

(Type: Numeric) -5

1 point

5)



In the figure above, determine the voltage v_c at $t = 6 \mu s$. The capacitor is initially discharged (i.e. the capacitor voltage is zero at $t = 0$). (The waveform consists of straight line segments)

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

No, the answer is incorrect.

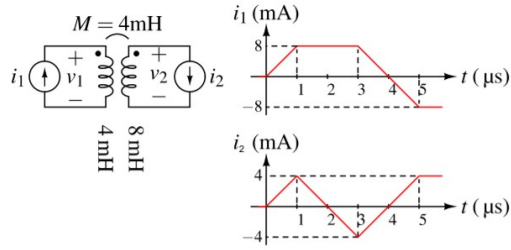
Score: 0

Accepted Answers:

(Type: Numeric) 700

1 point

6)



In the figure above, determine the voltage v_2 at $t = 4\mu s$. (The waveform consists of straight line segments)

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

No, the answer is incorrect.

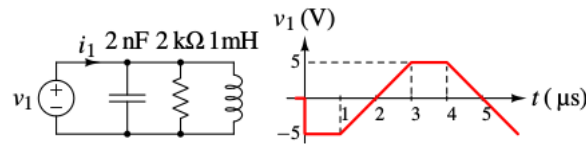
Score: 0

Accepted Answers:

(Type: Numeric) -64

1 point

7)



In the figure above, determine the current i_1 at $t = 5\mu s$. The inductor current is zero at $t = 0$. (The waveform consists of straight line segments)

(The answer must be in **milliamperes (mA)**. Round off fractional answers to one decimal place.)

No, the answer is incorrect.

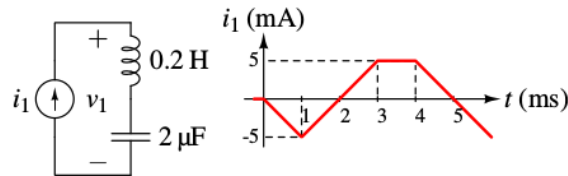
Score: 0

Accepted Answers:

(Type: Numeric) -7.5

1 point

8)



In the figure below, determine the voltage v_1 at $t = 5ms$. The capacitor voltage and inductor current are zero at $t = 0$.

(The waveform consists of straight line segments)

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

No, the answer is incorrect.

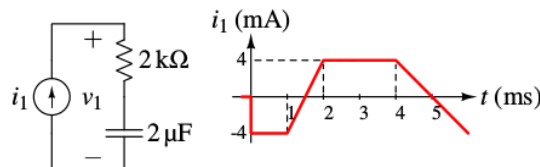
Score: 0

Accepted Answers:

(Type: Numeric) 1.5

1 point

9)



In the figure below, determine the voltage v_1 at $t = 5ms$. The capacitor voltage is zero at $t = 0$.

(The waveform consists of straight line segments)

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

No, the answer is incorrect.

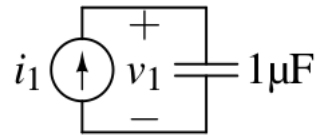
Score: 0

Accepted Answers:

(Type: Numeric) 3

1 point

10)



In the figure above, $i_1 = 5\text{mA} \sin(2\pi \times 10^3 t)$. Determine v_1 at $t = 1.5\text{ms}$. The capacitor voltage is zero at $t = 0$.

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

No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Numeric) 1.6

1 point