

Started on Thursday, 1 December 2016, 3:01 PM

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Completed on Thursday, 1 December 2016, 3:15 PM

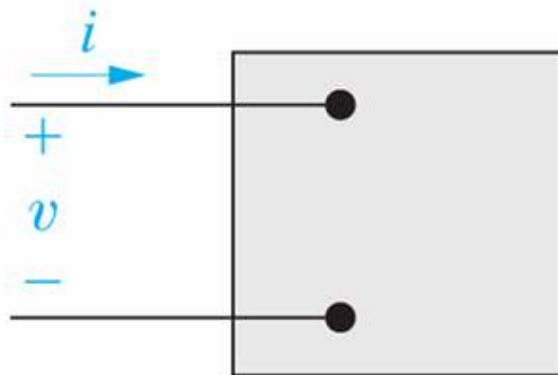
Time taken 13 mins 57 secs

Grade 100.00 out of 100.00

Question 1

Correct

Mark 10.00 out of 10.00



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P10.01a_9ed

For the following set of values, calculate P , Q and state whether the circuit inside the box is absorbing or delivering (1) average power and (2) magnetizing vars.

a) $v = 100 \cos(\omega t + 50^\circ) \text{ V}$ $i = 10 \cos(\omega t + 15^\circ) \text{ A}$

$P =$ ✓ W ✓ Watts

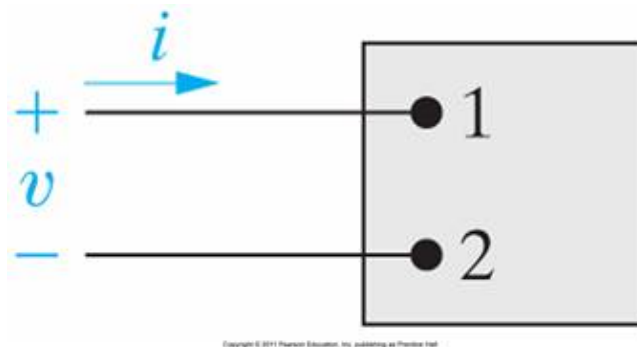
$Q =$ ✓ VAR ✓ VARs

Correct

Marks for this submission: 10.00/10.00.

Question 2

Correct

Mark 10.00 out of
10.00

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P10.01b_6ed

Calculate P and Q of the following voltage and current. State whether the element is absorbing or delivering average power and magnetizing VARs.

$$v = 75 \cos(\omega t - 15^\circ) \text{ V}$$

$$i = 16 \cos(\omega t + 60^\circ) \text{ A}$$

$P =$ ✓ W **Absorbing** ✓ Watts

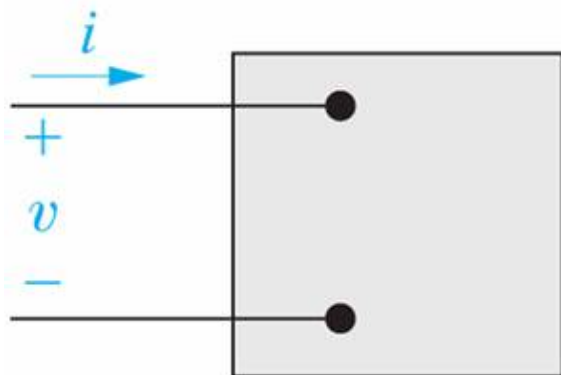
$Q =$ ✓ VAR **Delivering** ✓ VARs

Correct

Marks for this submission: 10.00/10.00.

Question 3

Correct

Mark 10.00 out of
10.00

P10.01b_9ed

For the following set of values, calculate P, Q and state whether the circuit inside the box is absorbing or delivering (1) average power and (2) magnetizing vars.

b) $v = 40 \cos(\omega t - 15^\circ) \text{ V}$ $i = 20 \cos(\omega t + 60^\circ) \text{ A}$

P = ✓ W ✓ Watts

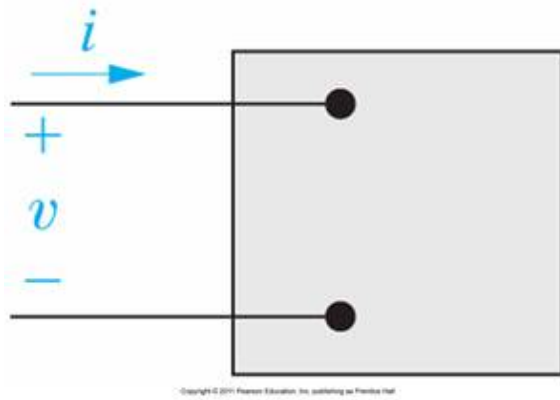
Q = ✓ VAR ✓ VARs

Correct

Marks for this submission: 10.00/10.00.

Question 4

Correct

Mark 10.00 out of
10.00

P10.01d_9ed

For the following set of values, calculate P, Q and state whether the circuit inside the box is absorbing or delivering (1) average power and (2) magnetizing vars.

d) $v = 200 \sin(\omega t + 250^\circ) \text{ V}$ $i = 5 \cos(\omega t + 40^\circ) \text{ A}$

P = ✓ W ✓ Watts

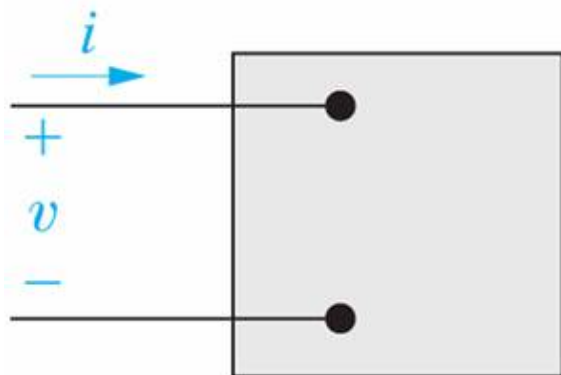
Q = ✓ VAR ✓ VARs

Correct

Marks for this submission: 10.00/10.00.

Question 5

Correct

Mark 10.00 out of
10.00

P10.01c_9ed

For the following set of values, calculate P, Q and state whether the circuit inside the box is absorbing or delivering (1) average power and (2) magnetizing vars.

c) $v = 400 \cos(\omega t + 30^\circ) \text{ V}$ $i = 10 \sin(\omega t + 240^\circ) \text{ A}$

P = ✓ W ✓ Watts

Q = ✓ VAR ✓ VARs

Correct

Marks for this submission: 10.00/10.00.

Question 6

Correct

Mark 10.00 out of 10.00

$$P_{\max} = P_{\text{avg}} + \sqrt{P^2 + Q^2}$$

$$P_{\min} = P_{\text{avg}} - \sqrt{P^2 + Q^2}$$

P10.04_9ed

A load consisting of a 480 W resistor in parallel with a $(5/9) \mu\text{F}$ (micro Farad) capacitor is connected across the terminals of a sinusoidal voltage source $v_g = 240 \cos(5,000t) \text{ V}$.

a) What is the average power absorbed/delivered by the load?

$$P_{\text{avg}} = \boxed{60} \checkmark \text{ W}$$

b) What is the reactive power absorbed/delivered by the load?

$$Q = \boxed{-80} \checkmark \text{ VAR}$$

c) What is the peak value of the instantaneous power delivered by the source?

The figure shows the result of a derivation for p_{\max} .

$$p_{\max} = \boxed{-160} \checkmark \text{ W ("+" = absorbed, "-" = delivered)}$$

d) What is the peak value of the instantaneous power absorbed by the source?

The figure shows the result of a derivation for p_{\min} .

$$p_{\min} = \boxed{40} \checkmark \text{ W ("+" = absorbed, "-" = delivered)}$$

e) What is the power factor of the load?

$$\text{pf} = \boxed{.6} \checkmark$$

f) What is the reactive factor of the load?

$$\text{rf} = \boxed{-.8} \checkmark \text{ ("+" = inductive, "-" = capacitive)}$$

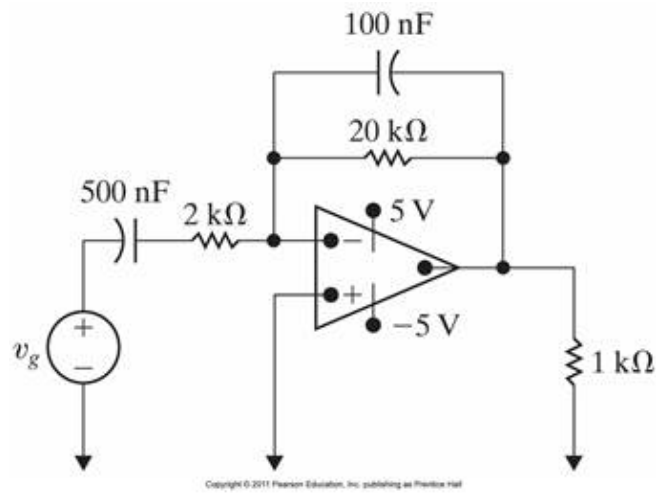
Correct

Marks for this submission: 10.00/10.00.

Question 7

Correct

Mark 10.00 out of 10.00



P10.07_9ed

The opamp is ideal. $v_g = \cos(1,000t) \text{ V}$

Calculate the average power dissipated by the 1 kΩ (kilo Ohm) resistor.

$P_{\text{avg}, 1\text{k}\Omega} =$ \checkmark mW (milli Watt) (“+” = absorbed, “-” = delivered)

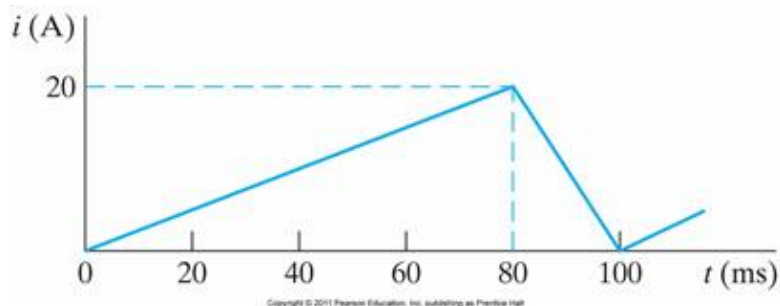
Correct

Marks for this submission: 10.00/10.00.

Question 8

Correct

Mark 10.00 out of 10.00



P10.13_9ed

Given: The period of the waveform is 100 ms (milli sec).

a) Find the rms value of the periodic waveform shown in the figure.

$I_{\text{rms}} =$ \checkmark A_{rms}

b) Given that the periodic waveform dissipates an average power of 1,280 W in a resistor. What is the value of the resistor?

$R =$ \checkmark Ω (Ohm)

Correct

Marks for this submission: 10.00/10.00.

Question 9

Correct

Mark 10.00 out of 10.00

P10.11b_9ed

A laser printer is rated at 90 W at $115V_{\text{rms}}$.

a) Calculate the rms value of the current drawn by the laser printer.

$$i_{\text{printer,rms}} = \boxed{.78} \checkmark \text{ Arms}$$

b) Calculate the peak magnitude of the voltage fed to the laser printer.

$$V_{\text{peak}} = \boxed{162.6} \checkmark \text{ V}$$

Correct

Marks for this submission: 10.00/10.00.

Question 10

Correct

Mark 10.00 out of 10.00

P10.11a_9ed

A personal computer with a monitor and keyboard voltage and current are:

$$v(t) = 115 \cos(2\pi 60 + 0^\circ) V_{\text{rms}} \quad i(t) = 0.5 \cos(2\pi 60 - 25^\circ) \text{ Arms}$$

Calculate the real power absorbed by the computer system.

$$P_{\text{computer}} = \boxed{52.11} \checkmark \text{ W ("+" = absorbed, "-" = delivered)}$$

Correct

Marks for this submission: 10.00/10.00.