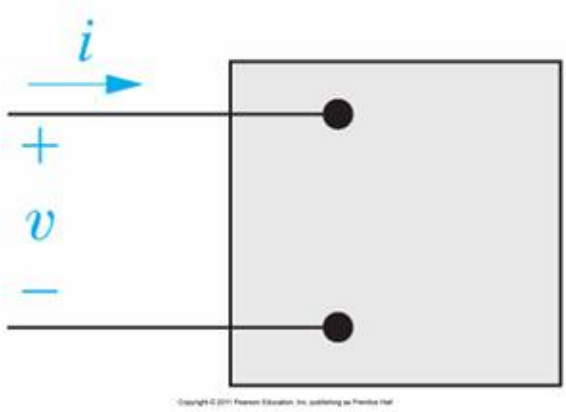
Started on	Saturday, 3 December 2016, 9:01 PM
State	Finished
Completed on	Sunday, 4 December 2016, 1:42 AM
Time taken	4 hours 41 mins
Grade	**100.00** out of 100.00

Question 1

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) $v = 40\cos(\omega t - 15°)$ V $i = 20\cos(\omega t + 60°)$ A

P = 103.53 ✓ W Absorbing ✓ Watts

Q = -386.37 ✓ VAR Delivering ✓ VARs

Numeric Answer

b) P = 103.53W abs Q = -386.37 VAR del

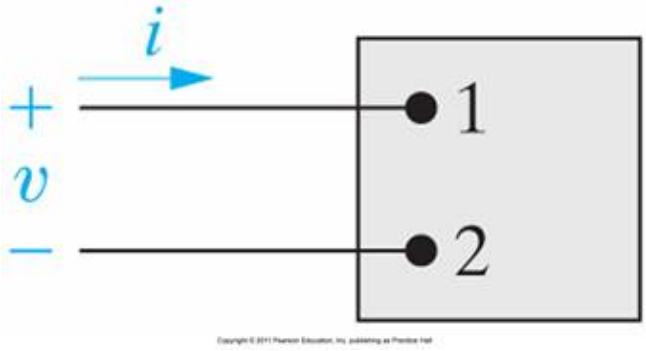
Correct

Marks for this submission: 10.00/10.00.

Question 2

Correct

Mark 10.00 out of 10.00



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(ωt - 15°) V i = 16 cos(ωt + 60°) A

P = 155.29 ✓ W Absorbing ✓ Watts

Q = -579.56 ✓ VAR Delivering ✓ VARs

Numeric Answer

P = 155.3 W abs Q = -579.6 VAR del

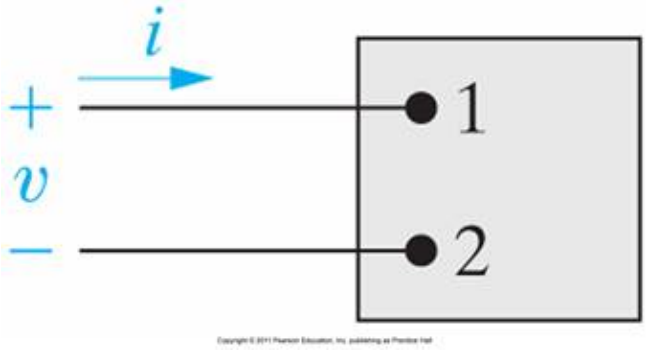
Correct

Marks for this submission: 10.00/10.00.

Question 3

Correct

Mark 10.00 out of 10.00



P10.01a_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 = 340 cos(ωt + 60°) V i = 20 cos(ωt + 15°) A

P = 2404.16 ✓ W Absorbing ✓ Watts

Q = 2404.16 ✓ VAR Absorbing ✓ VARS

Numeric Answer

P = 2,404.16 abs Q = 2404.16 VAR abs

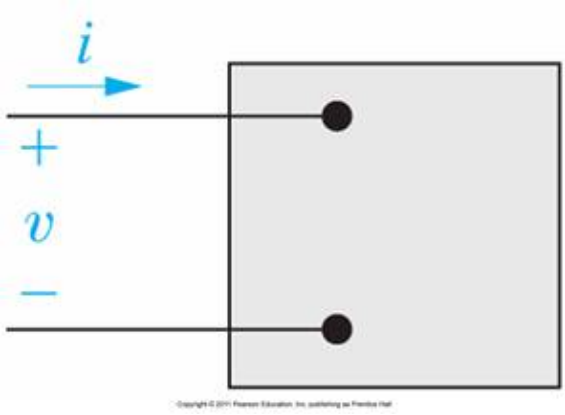
Correct

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) $v = 200 \sin(\omega t + 250°)$ V $i = 5 \cos(\omega t + 40°)$ A

P = -250 ✓ W ~~Delivering~~ ✓ Watts

Q = 433.01 ✓ VAR Absorbing ✓ VARs

Numeric Answer

d) P = -250W del Q = 433.01 VAR abs

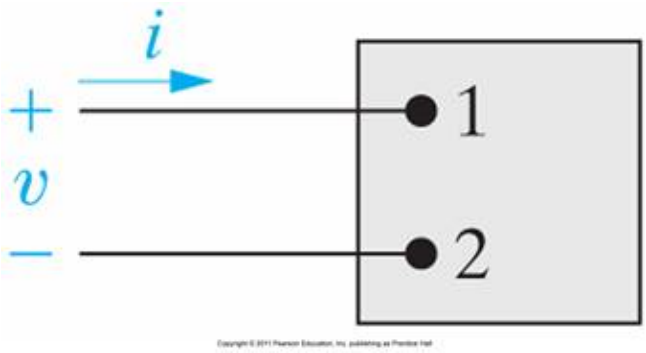
Correct

Marks for this submission: 10.00/10.00.

Question 5

Correct

Mark 10.00 out of 10.00



P10.01d_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 = 180 sin(ωt + 220°) V i = 10 cos(ωt + 20°) A

P = -307.82 ✓ W ~~Delivering~~ ✓ Watts

Q = 845.72 ✓ VAR Absorbing ✓ VARs

Numeric Answer

P = -307.8 W delivering Q = 845.7 VAR absorbing

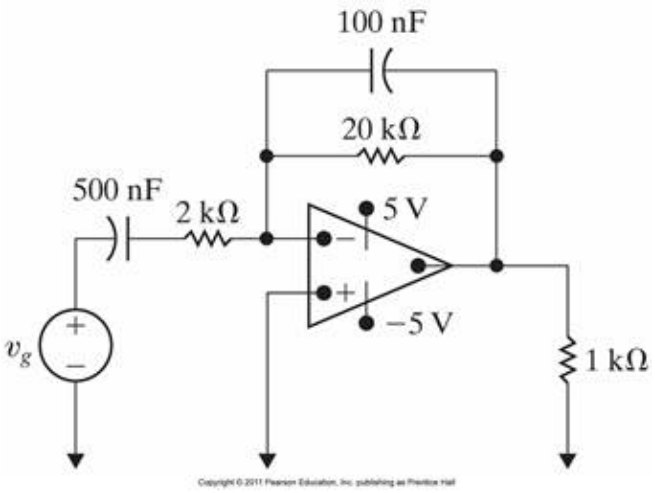
Correct

Marks for this submission: 10.00/10.00.

Question 6

Correct

Mark 10.00 out of 10.00



P10.07_9ed

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

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

$P_{avg,1k\Omega}$ = 5 ✓ mW (milli Watt) ("+" = absorbed, "-" = delivered)

Numeric Answer

$P_{avg,1kW}$ = 5 mW (milli Watt)

Correct

Marks for this submission: 10.00/10.00.

Question 7

Correct

Mark 10.00 out of 10.00

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

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

P10.04_9ed

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

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

P_{avg} = 60 ✓ W

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

Q = -80 ✓ 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} = -160 ✓ 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} = 40 ✓ W ("+" = absorbed, "-" = delivered)

e) What is the power factor of the load?

pf = .6 ✓

f) What is the reactive factor of the load?

rf = -0.8 ✓ ("+" = inductive, "-" = capacitive)

Numeric Answer

a) P_{avg} = 60 W

b) Q = -80 VAR

c) P_{peak} = -160W delivered

d) P source = 40 W absorbed

e) pf = 0.6 leading

f) rf = -0.8

Correct

Marks for this submission: 10.00/10.00.

Question 8

Correct

Mark 10.00 out of 10.00

P10.11b_9ed

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

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

$i_{printer,rms}$ = .78 ✓ Arms

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

V_{peak} = 162.6 ✓ V

Numeric Answer

a) $i_{printer,rms}$ = 0.7826A_{rms}

b) V_{peak} = 162.6346V

Correct

Marks for this submission: 10.00/10.00.

Question 9

Correct

Mark 10.00 out of 10.00

P10.11a_9ed

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

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

Calculate the real power absorbed by the computer system.

$P_{computer}$ = 52.11 ✓ W ("+" = absorbed, "-" = delivered)

Numeric Answer

$P_{computer}$ = 52.1127W

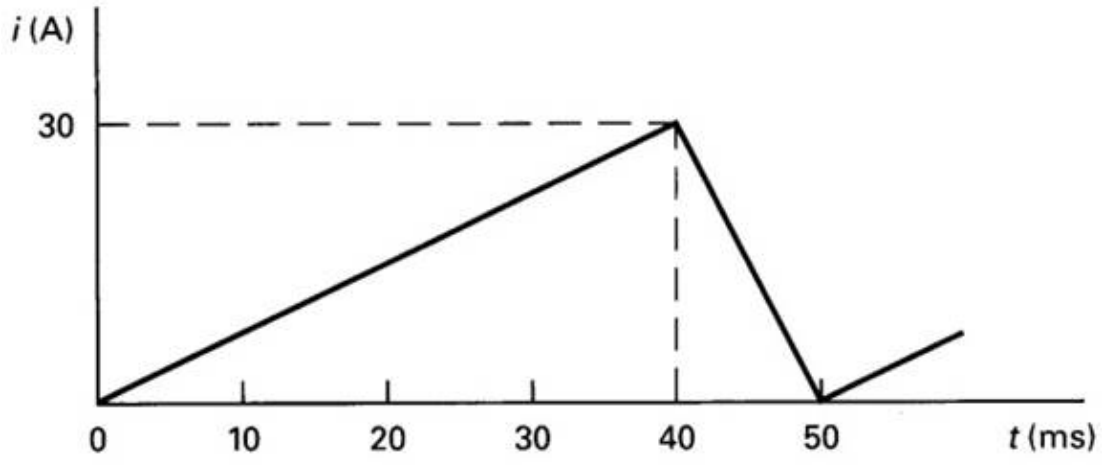
Correct

Marks for this submission: 10.00/10.00.

Question 10

Correct

Mark 10.00 out of 10.00



P10.5_6ed

Given: The period of the waveform is 50 ms (milli sec).

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

i_{rms} = 17.32 ✓ A_{rms}

b) Given that the periodic waveform dissipates an average power of 24 kW in a resistor. What is the value of the resistor?

R = 80 ✓ Ω (Ohm)

Numeric Answer

a) i_{rms} = 17.321 A_{rms}

b) R = 80.0 Ω (Ohm)

Correct

Marks for this submission: 10.00/10.00.