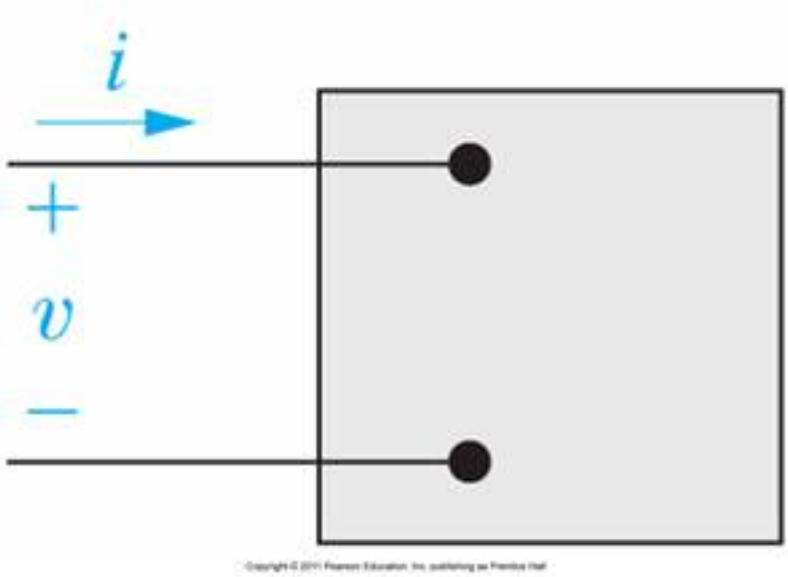
Started on	Wednesday, 6 February 2019, 11:38 AM
State	Finished
Completed on	Wednesday, 6 February 2019, 11:39 AM
Time taken	44 secs
Grade	**100.00** out of 100.00

Question 1

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 ✓ VARs Absorbing ▼ ✓ VARs

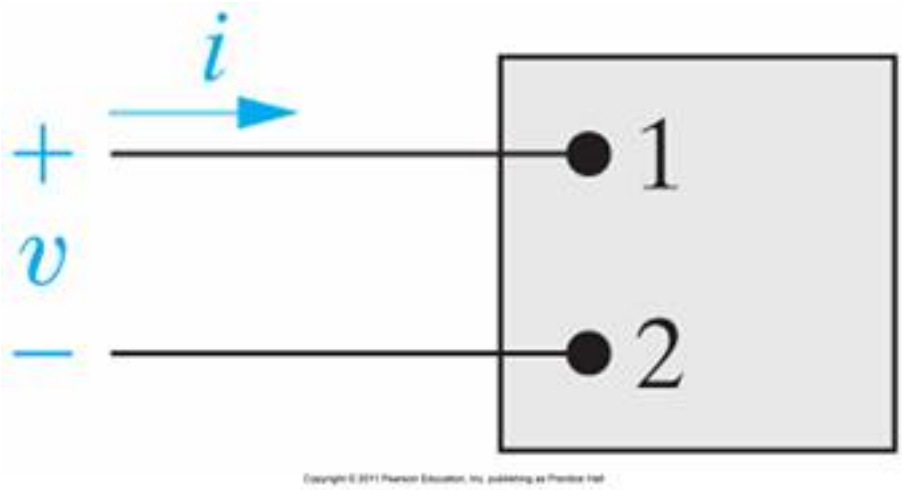
Correct

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 ✓ W Absorbing ▼ ✓ Watts

Q = -577 ✓ VAR Delivering ▼ ✓ VARs

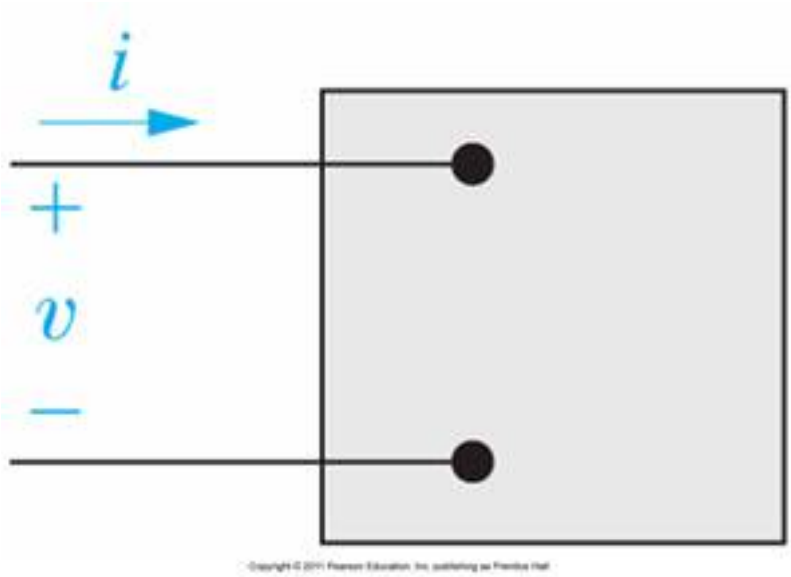
Correct

Marks for this submission: 10.00/10.00.

Question 3

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) $v = 400 \cos(\omega t + 30°)$ V $i = 10 \sin(\omega t + 240°)$ A

P = -1000 ✓ W Delivering ▼ ✓ Watts

Q = -1732.05 ✓ VARs Delivering ▼ ✓ VARs

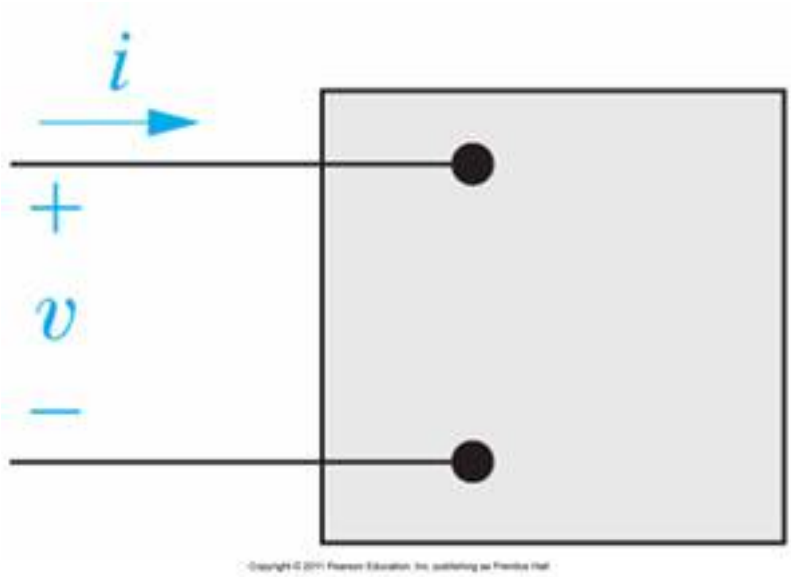
Correct

Marks for this submission: 10.00/10.00.

Question 4

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 = 103.5 ✓ W Absorbing ▼ ✓ Watts

Q = -386 ✓ VARs Delivering ▼ ✓ VARs

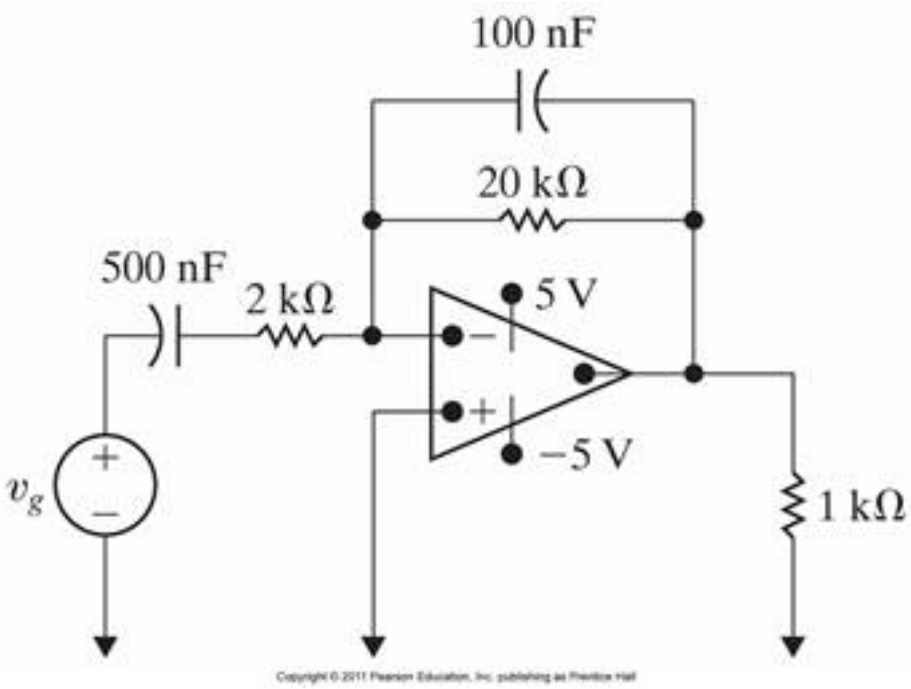
Correct

Marks for this submission: 10.00/10.00.

Question 5

Correct

Mark 10.00 out of 10.00



P10.07_9ed

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

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

$P_{avg,1k\Omega}$ = 4.97 ✓ mW (milli Watt) "+" = absorbed "-" = delivered

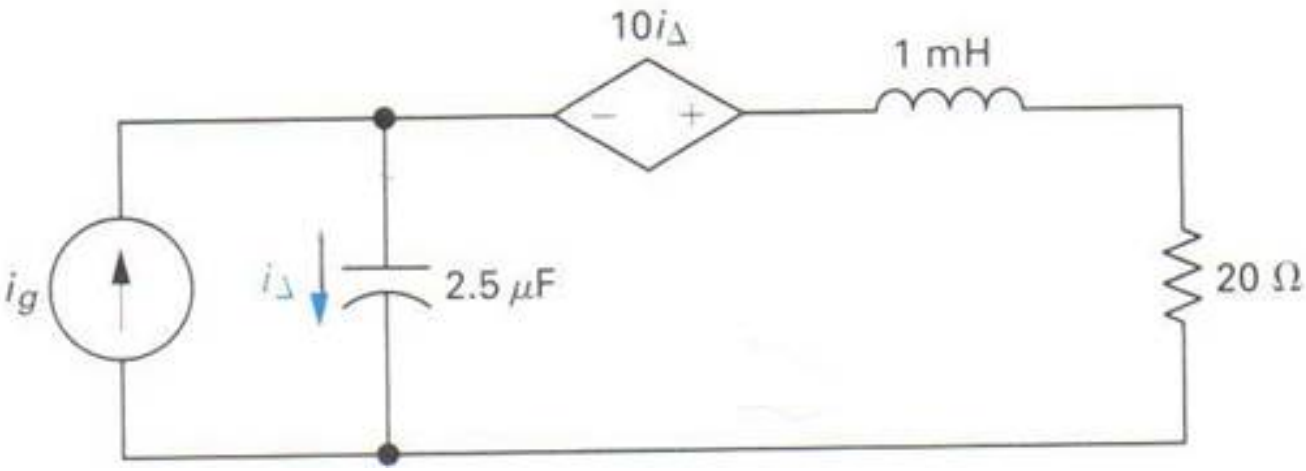
Correct

Marks for this submission: 10.00/10.00.

Question 6

Correct

Mark 10.00 out of 10.00



P10.9_6ed

Given: $i_g = 15 \cos(10{,}000\ t)$ A

Find the average power absorbed by the 20 Ω (Ohm) resistor.

$P_{avg,20\Omega}$ = 2125 ✓ W "+" = absorbed and "-" = delivered

Correct

Marks for this submission: 10.00/10.00.

Question 7

Correct

Mark 10.00 out of 10.00

P10.11a_9ed

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

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

Calculate the real power absorbed by the computer system.

$P_{computer}$ = 52 ✓ W "+" = absorbed "-" = delivered

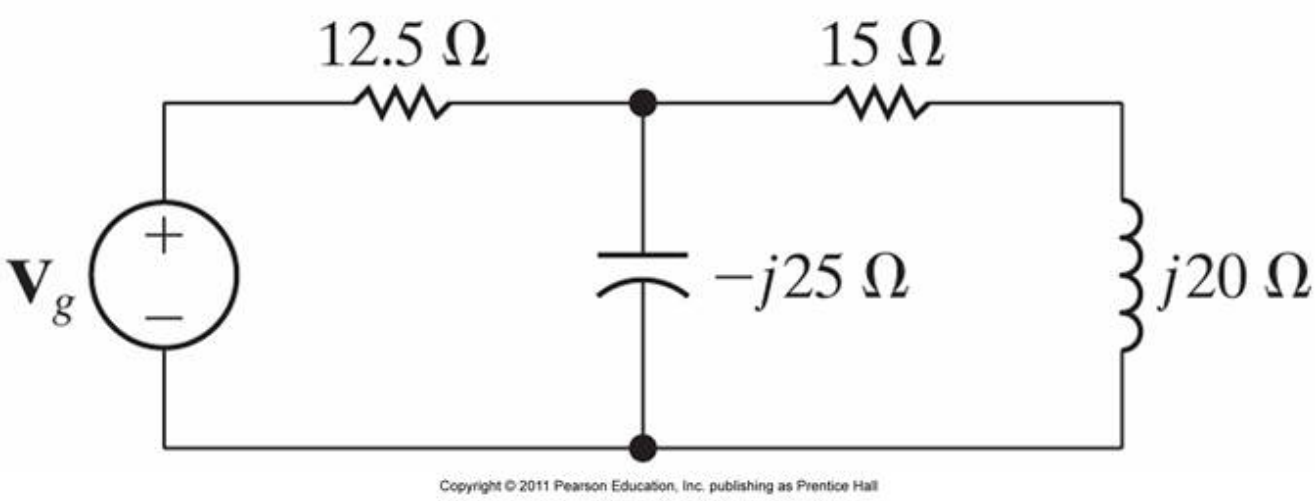
Correct

Marks for this submission: 10.00/10.00.

Question 8

Correct

Mark 10.00 out of 10.00



P10.16_9ed

The voltage V_g is 240 at angle 0° V_{rms} (240 V_{rms} at angle zero degrees)

a) Find the average and reactive power for the voltage source V_g.

S_g = -1084 ✓ + j 271 ✓ VA

b) Is the voltage source absorbing or delivering average power?

Delivering ▼ ✓ Watts

c) Is the voltage source absorbing or delivering magnetizing VARs?

Absorbing ▼ ✓ VARs

d) Find the average and reactive powers associated with each element in this circuit.

$P_{12.5\Omega}$ = 271 ✓ W

$Q_{-j25\Omega}$ = -1355 ✓ VAR

$P_{15\Omega}$ = 813 ✓ W

$Q_{j20\Omega}$ = 1084 ✓ VAR

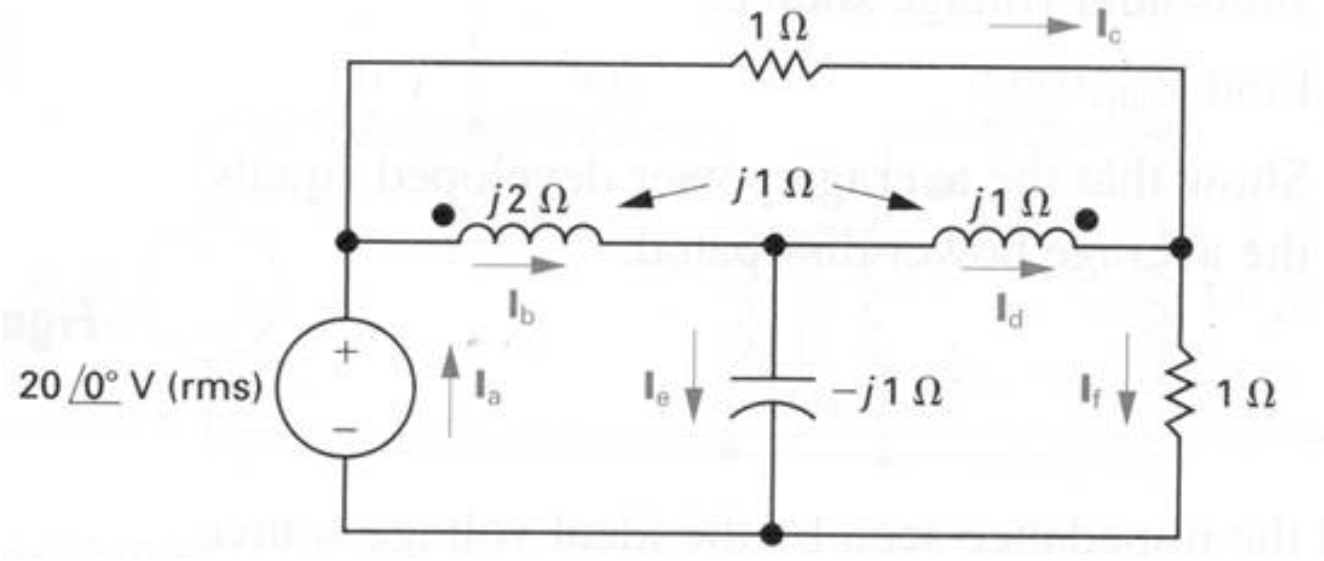
Correct

Marks for this submission: 10.00/10.00.

Question 9

Correct

Mark 10.00 out of 10.00



P10.48_6ed

Mesh analysis in a mutually inductive circuit.

a) Find the six phasor branch currents.

$\mathbf{I_a}$ = 20 ✓ + j -20 ✓ A_{rms}

$\mathbf{I_b}$ = 0 ✓ + j -20 ✓ A_{rms}

$\mathbf{I_c}$ = 20 ✓ + j 0 ✓ A_{rms}

$\mathbf{I_d}$ = -20 ✓ + j 0 ✓ A_{rms}

$\mathbf{I_e}$ = 20 ✓ + j -20 ✓ A_{rms}

$\mathbf{I_f}$ = 0 ✓ + j 0 ✓ A_{rms}

b) Find the complex power in each of the six branches.

S_a = -400 ✓ + j -400 ✓ VA

$S_b =$ -400 ✓ $+ j$ 800 ✓ VA

$S_c =$ 400 ✓ $+ j$ 0 ✓ VA

$S_d =$ 400 ✓ $+ j$ 400 ✓ VA

$S_e =$ 0 ✓ $+ j$ -800 ✓ VA

$S_f =$ 0 ✓ $+ j$ 0 ✓ VA

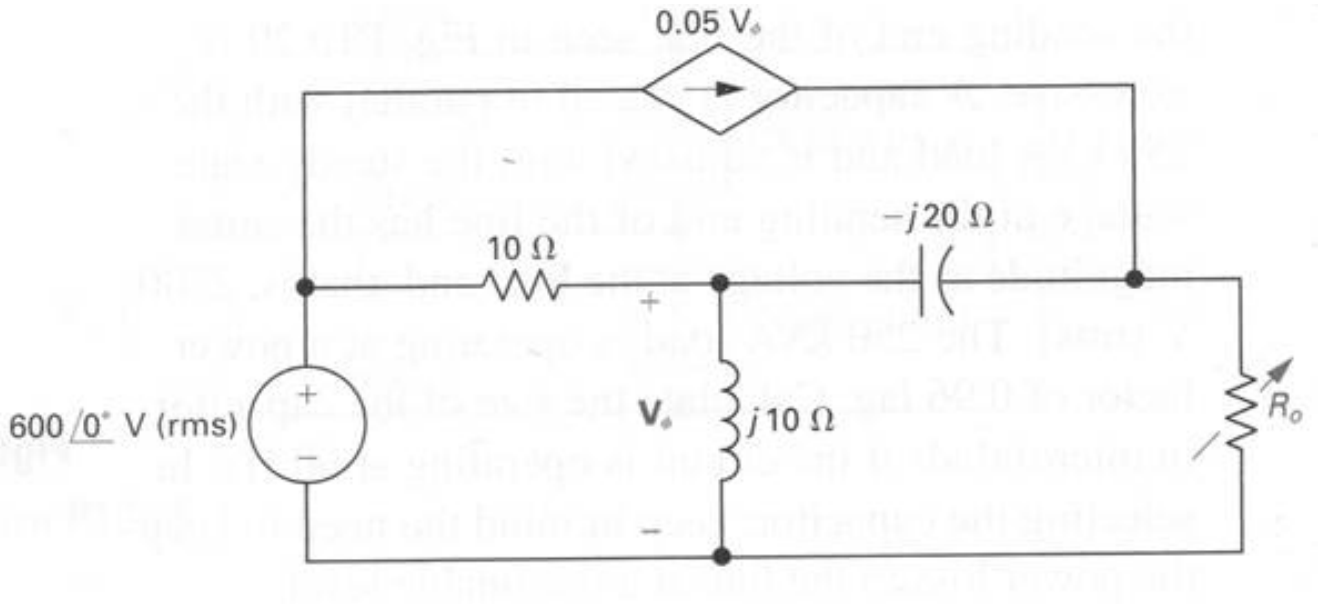
Correct

Marks for this submission: 10.00/10.00.

Question 10

Correct

Mark 10.00 out of 10.00



P10.33_6ed

The variable resistor R_0 in this circuit is adjusted until maximum average power is delivered to R_0.

a) What is the value of R_0 in Ohms?

R_0 = 20 ✓ Ω (Ohm)

b) Calculate the average power delivered to R_0 in this maximum average power condition.

P_{R0} = 9000 ✓ W

c) If R_0 is replaced with variable impedance Z_0, what is the maximum average power that can be delivered to Z_0?

P_{Z0} = 12000 ✓ W

Correct

Marks for this submission: 10.00/10.00.

◄ Homework 2 - Chapter 9

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Homework 4 - Chapter 11 ►