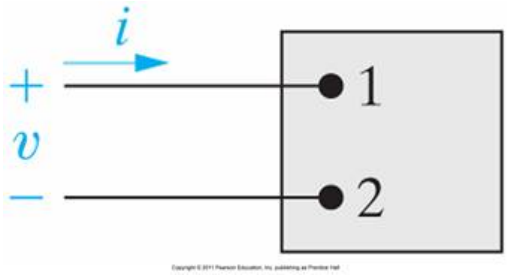
Started on	Sunday, 12 February 2017, 3:25 PM
State	Finished
Completed on	Sunday, 12 February 2017, 3:25 PM
Time taken	7 secs
Grade	**90.00** out of 100.00

Question 1

Correct

Mark 10.00 out of 10.00



P10.01c_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 = 625 cos(ωt + 40°) V i = 4 sin(ωt + 240°) A

P = -427.52 ✓ W Delivering ✓ Watts

Q = -1174.6 ✓ VAR Delivering ✓ VARs

Numeric Answer

P = -427.5 W delivering Q = -1,174.6 VAR delivering

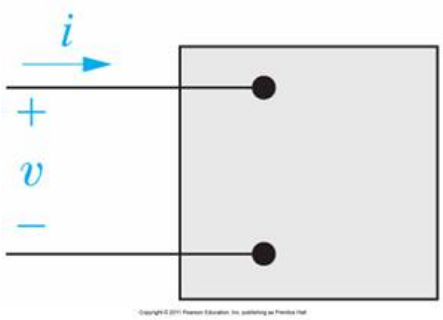
Correct

Marks for this submission: 10.00/10.00.

Question 2

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(ωt + 30°) V i = 10 sin(ωt + 240°) A

P = -1000 ✓ W ~~Delivering~~ ✓ Watts

Q = -1732.05 ✓ VARs Delivering ✓ VARs

Numeric Answer

c) P = -1,000 W del Q = -1,732.05 VAR del

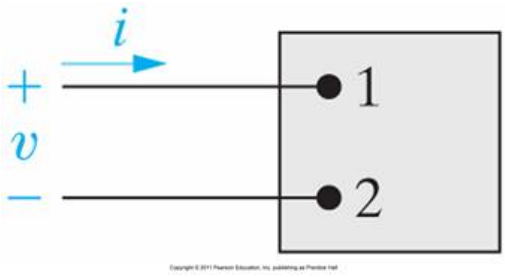
Correct

Marks for this submission: 10.00/10.00.

Question 3

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

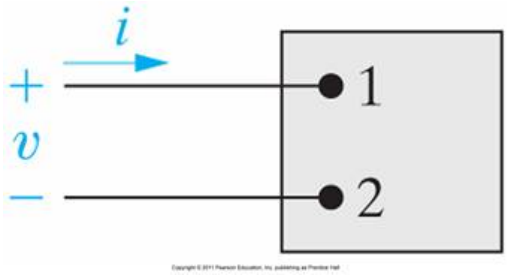
Correct

Marks for this submission: 10.00/10.00.

Question 4

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 = 2404.163 ✓ W Absorbing ✓ Watts

Q = 2404.163 ✓ VAR Absorbing ✓ VARs

Numeric Answer

P = 2,404.16 abs Q = 2404.16 VAR abs

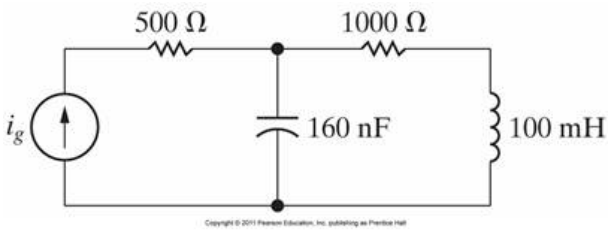
Correct

Marks for this submission: 10.00/10.00.

Question 5

Correct

Mark 10.00 out of 10.00



P10.05_9ed

Find the average power delivered by the ideal current source i_g = 4 cos (5,000 t) mA (milli Amp).

P_g = -12 ✓ mW (milli Watt) "+" = absorbed, "-" = delivered

Numeric Answer

P_g = -12 mW (milli Watt)

Correct

Marks for this submission: 10.00/10.00.

Question 6

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.

$i_{printer,rms}$ = 0.7826 ✓ Arms

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

V_{peak} = 162.634 ✓ V

Numeric Answer

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

b) $V_{peak} = 162.6346V$

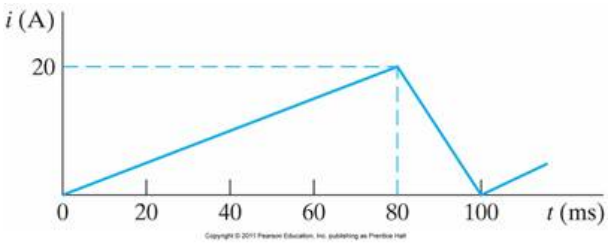
Correct

Marks for this submission: 10.00/10.00.

Question 7

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_{rms} = 11.55 ✓ 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 = 9.6 ✓ Ω (Ohm)

Numeric Answer

a) $I_{rms} = 11.5470\ A_{rms}$

b) R = 9.6 Ω (Ohm)

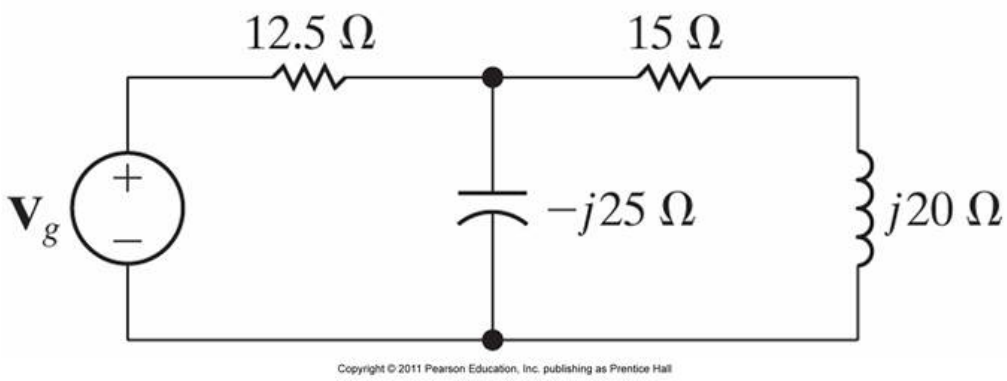
Correct

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 = -1084.24 ✓ + j 271.06 ✓ 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.

$P_{12.5\Omega}$ = 271.06 ✓ W

$Q_{-j25\Omega}$ = -1355.29 ✓ VAR

$P_{15\Omega}$ = 813.18 ✓ W

$Q_{j20\Omega}$ = 1084.24 ✓ VAR

Numeric Answer

a) S_g = - 1,084.224 + j 271.056 VA

b) The source is delivering -1,084.224 Watts

c) The source is absorbing 271.056 VARS.

d) $P_{12.5\Omega}$ = 271.08 W

$Q_{-j25\Omega}$ (Capacitor) = -1,355.280 VAR

$P_{15\Omega}$ = 813.173 W

$Q_{j20\Omega}$ (Inductor) = 1,084.23 VAR

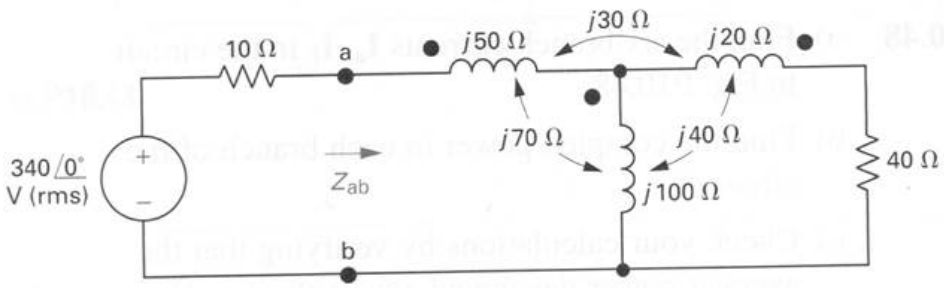
Correct

Marks for this submission: 10.00/10.00.

Question 9

Incorrect

Mark 0.00 out of 10.00



P10.53_6ed

a) Find the average power absorbed/delivered by the 40 Ω (Ohm) resistor.

$P_{avg,40\Omega}$ = 576000 ✗ W "+" = absorbed and "-" = delivered

b) Find the average power absorbed/delivered by the ideal sinusoidal voltage source.

$P_{avg,source}$ = 34000 ✗ W

Numeric Answer

a) $P_{avg,40\Omega}$ = 1,440 W Absorbed

b) $P_{avg,source}$ = -1,700 W Delivered

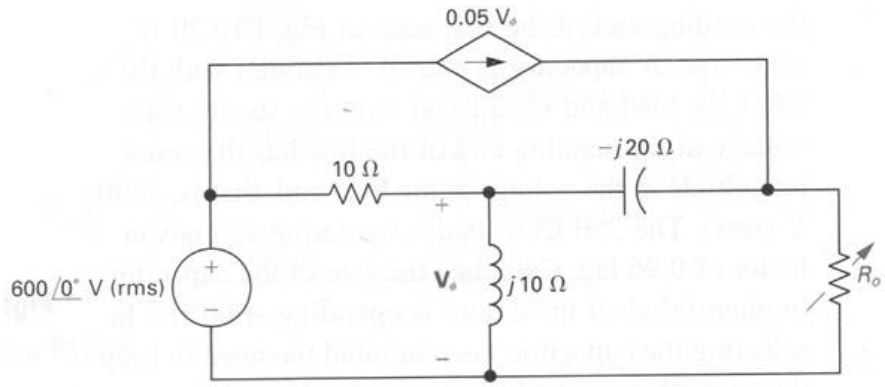
Incorrect

Marks for this submission: 0.00/10.00.

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

Numeric Answer

a) R_0 = 20 Ω (Ohm)

b) PR_0 = 9,000 W

c) PZ_0 = 12 kW

Correct

Marks for this submission: 10.00/10.00.