Started on	Monday, 14 November 2016, 2:29 AM
State	Finished
Completed on	Monday, 14 November 2016, 2:38 AM
Time taken	8 mins 28 secs
Grade	**70.00** out of 100.00

Question 1

Correct

Mark 10.00 out of 10.00

AP9.01_9ed

Find the phasor (based on cosine) transform of each trigonometric function:

a) $v = 170 \cos(377\,t - 40°)$ Volts

V_{phasor} Magnitude = 170 ✓ V

Angle = -40 ✓ ° (Degrees)

b) $i = 10 \sin(1{,}000\,t + 20°)$ Amps

I_{phasor} Magnitude = 10 ✓ V

Angle = -70 ✓ ° (Degrees)

c) $i = 5 \cos(\omega\,t + 36.87°) + 10 \cos(\omega\,t - 53.13°)$ Amps

I_{phasor} Magnitude = 11.18 ✓ V

Angle = -26.57 ✓ ° (Degrees)

d) $v = 300 \cos(20{,}000\,\pi\,t + 45°) - 100 \sin(20{,}000\,\pi\,t + 30°)$ mV

V_{phasor} Magnitude = 339.90 ✓ mV

Angle = 61.51 ✓ ° (Degrees)

Numeric Answer

a) V_{phasor} = 170 at angle -40° Volts

b) I_{phasor} = 10 at angle -70° Amps

c) I_{phasor} = 11.18 at angle -26.56° Amps

d) V_{phasor} = 339.9 at angle 61.51° Volts

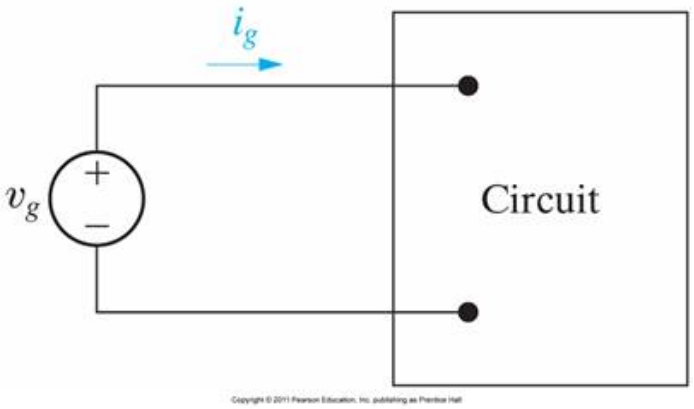
Correct

Marks for this submission: 10.00/10.00.

Question 2

Correct

Mark 10.00 out of 10.00



P9.12_9ed

The expressions for the steady-state voltage and current at the terminals of the circuit are

$v_g = 300 \cos(5{,}000\,\pi\,t + 78°)$ V

$i_g = 6 \sin(5{,}000\,\pi\,t + 123°)$ A

a) What is the impedance seen by the source? Write in rectangular form.

Z = 35.63 ✓ + j 35.63 ✓ Ω (Ohm)

b) By how much time t in microseconds is the current out of phase with the voltage?

i_g lags v_g by 50 ✓ μs (micro sec)

Numeric Answer

a) Z = 35.355 + j 35.355 Ω

b) t_{lag} = 50 μs

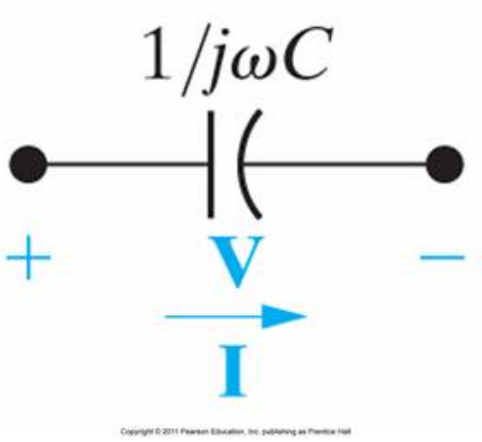
Correct

Marks for this submission: 10.00/10.00.

Question 3

Correct

Mark 10.00 out of 10.00



AP9.04_9ed

The voltage across the terminals of the 5 µF (micro F) capacitor is 30 cos (4,000 t + 25°) V.

a) Calculate the capacitive reactance.

X_C = -50 ✓ Ohms

b) Calculate the impedance of the capacitor.

Z_C = j -50 ✓ Ohms

c) Calculate the phasor current **I**.

I = Magnitude .6 ✓ with Angle 115 ✓ Degrees Amps

d) Write the steady-state expression for i(t).

i(t) = .6 ✓ cos (4000 ✓ t + 115 ✓°) Amps

Numeric Answer

a) X_C = -50 Ω (Ohm)

b) Z_C = -j50 Ω (Ohm)

c) I = 0.6Ð115° Volts

d) i(t) = 0.6 cos (4,000t + 115°) Volts

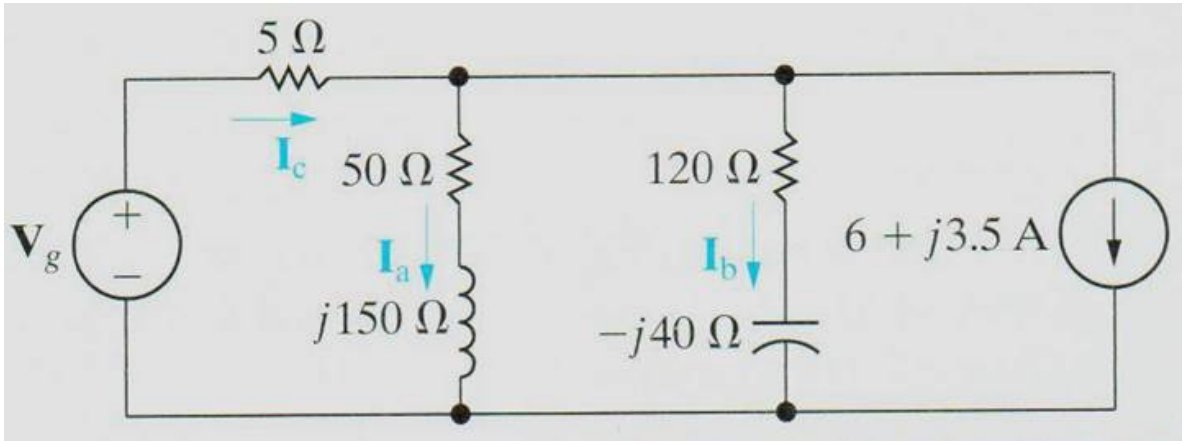
Correct

Marks for this submission: 10.00/10.00.

Question 4

Not answered

Mark 0.00 out of 10.00



P9.40_7ed

Given the phasor current $\mathbf{I}_a = 2$ at angle 0° A (magnitude 2 with angle 0 degrees Amps).

Find the following phasor values:

$\mathbf{I}_b$ = Magnitude [ ] with Angle [ ]° (Degrees) Amps

$\mathbf{I}_c$ = Magnitude [ ] with Angle [ ]° (Degrees) Amps

$\mathbf{V}_g$ = Magnitude [ ] with Angle [ ]° (Degrees) Volts

Numeric Answer

$\mathbf{I}_b$ = 2.5 at angle 90° A

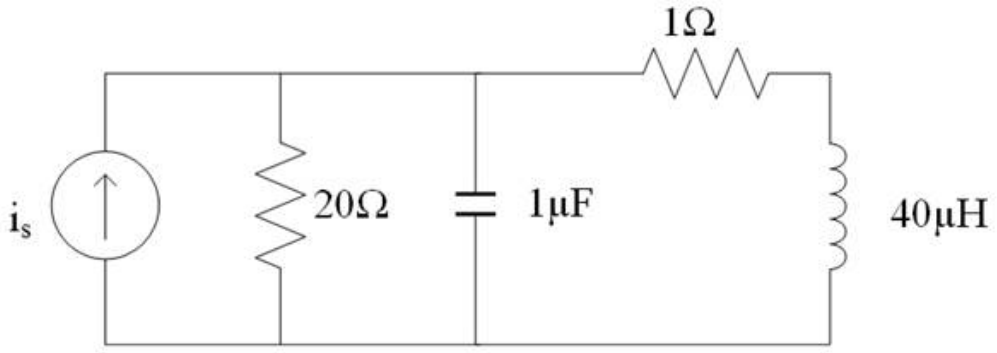
$\mathbf{I}_c$ = 10.0 at angle 36.87° A

$\mathbf{V}_g$ = 358.469 at angle 67.01° V

Question 5

Correct

Mark 10.00 out of 10.00



P9.09_6ed

Given: $i_s = 20\cos(50{,}000t - 20°)$ A.

Find the time domain voltage across the 20 Ω (Ohm) resistor.

$v_{20\Omega}(t)| =$ 46.5 ✓ cos(50,000 t + 34.46 ✓°) V

Numeric Answer

$v_{20W}(t)| = 46.5\cos(50{,}000\ t + 34.46°)$ Volts

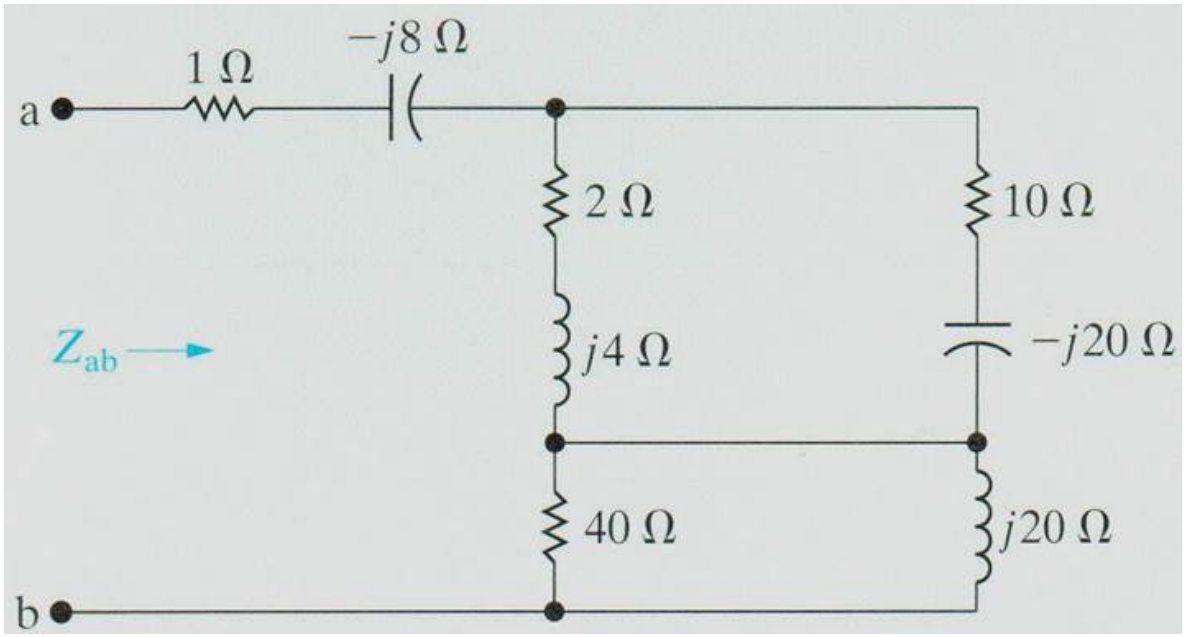
Correct

Marks for this submission: 10.00/10.00.

Question 6

Not answered

Mark 0.00 out of 10.00



P9.33_7ed

Find the equivalent impedance Zab at the terminals a,b.

$Z_{ab} =$ ✗ + j ✗ Ω (Ohm)

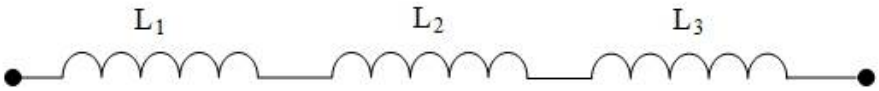
Numeric Answer

$Z_{ab} = 12.0 + j\ 12.0\ \Omega$ (Ohm)

Question 7

Correct

Mark 10.00 out of 10.00



Given:

L_1 = 9.4 mH (milli H) L_2 = 6.8 mH (milli H) L_3 = 19.8 mH (milli H)

The radian frequency of the driving source is 122615 rad/sec

Find the equivalent impedance of this series combination.

Z_{Leq} = j ?? Ω (Ohms)

Answer: 4414.14 ✓

Calculated Question

The correct answer is: 4414.140

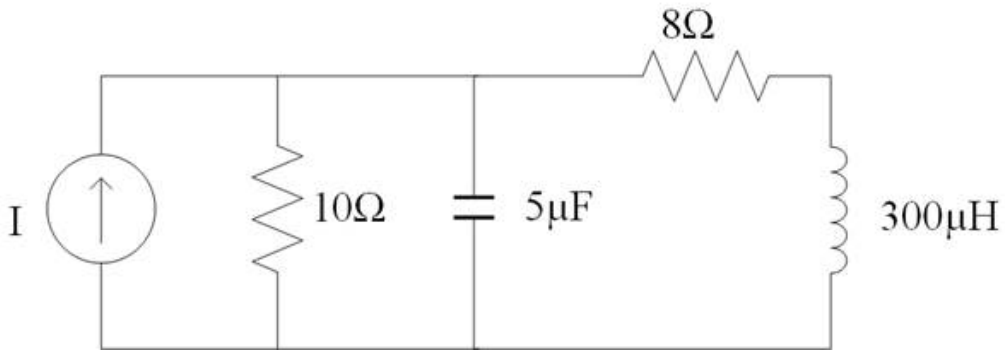
Correct

Marks for this submission: 10.00/10.00.

Question 8

Correct

Mark 10.00 out of 10.00



P9.16_9ed

Given: I = 922 cos(20,000 t + 30°) A.

What is the phasor voltage in polar form across the current source? Use the polarity of "top" equals positive voltage and "bottom" equals the reference node.

| V | = 5000.25 ✓ V

Angle = 17.47 ✓ ° (Degrees)

Numeric Answer

|V| = 5,000.25 V

Angle = 17.47 Degrees

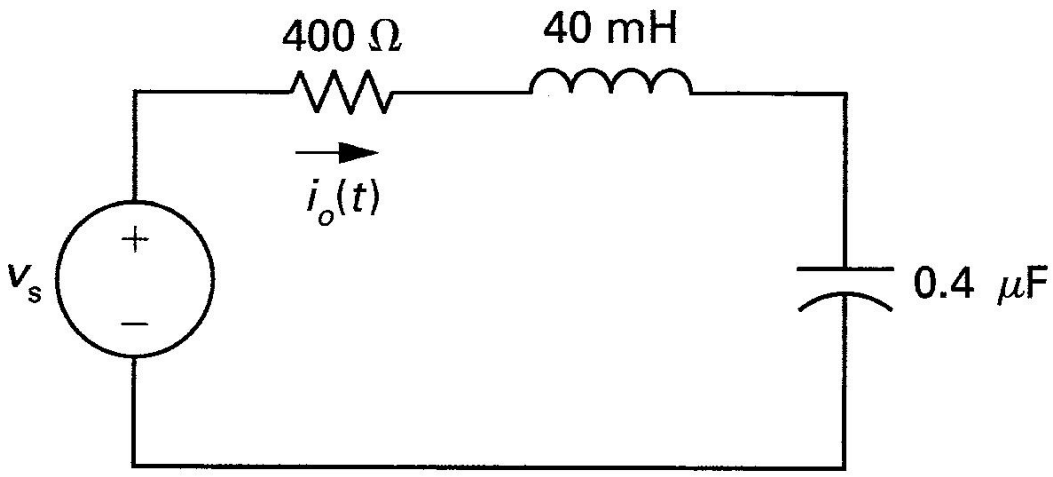
Correct

Marks for this submission: 10.00/10.00.

Question 9

Correct

Mark 10.00 out of 10.00



P9.14_6ed

Given: $v_s = 750 \cos(5{,}000\ t)$ V.

Find the time domain current $i_0(t)$.

$i_0(t)| =$ 1.5 ✓ $\cos(5{,}000\ t +$ 36.87 ✓°) A

Numeric Answer

$i_0(t)| = 1.5 \cos(5{,}000\ t + 36.87°)$ A

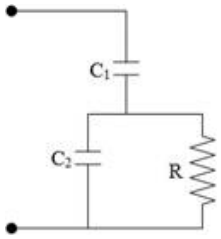
Correct

Marks for this submission: 10.00/10.00.

Question 10

Not answered

Mark 0.00 out of 10.00



Given:

$C_1 = 2.5$ μF (micro F) $C_2 = 14.2$ μF (micro F) $R = 12.4$ Ω (Ohms)

The radian frequency of the driving source is 3,000 rad/sec

Find the equivalent impedance of this circuit.

$Z_{Eq} =$ ✗ + j ✗ Ω (Ohms)

Numeric Answer

Real$\{Z_{Eq}\}$ = 9.6948 Ω (Ohms)

Imag$\{Z_{Eq}\}$ = - j 138.4545 Ω (Ohms)