Started on	Wednesday, 20 February 2019, 10:55 AM
State	Finished
Completed on	Wednesday, 20 February 2019, 11:55 AM
Time taken	1 hour
Grade	**90.00** out of 100.00

Question 1

Correct

Mark 10.00 out of 10.00

Q1b

Consider the sinusoidal voltage $v(t) = 100 \cos(240 \pi t + 45°)$ V_{rms}.

a) What is the maximum amplitude of the voltage?

V_m = 141.42 ✓ V

b) What is the frequency of v(t) in hertz?

f = 120 ✓ Hz

c) What is the frequency of v(t) in radians per second?

ω = 753.98 ✓ rad/sec

d) What is the phase angle in radians?

φ (phi) = 0.785 ✓ radians

e) What is the period in milliseconds?

T = 8.33 ✓ ms (milli sec)

Numeric Answer

a) V_m = 141.4214 V

b) f = 120 Hz

c) ω = 753.9822 rad/sec

d) φ (phi) = 0.7854 radians

e) T = 8.3333 ms (milli sec)

Correct

Marks for this submission: 10.00/10.00.

Question 2

Incorrect

Mark 0.00 out of 10.00

Q2d

Given: $x(t) = 350 \cos(300\,t + 15°) + 375 \cos(300\,t + 50°)$

Use the concept of the phasor to combine this sinusoidal function into a single trigonometric expression in the form similar to $x(t) = A \cos(\omega\,t + \theta°)$.

Magnitude A of x(t) = 150 ✗

Angle θ of x(t) = 180 ✗ Degrees

Numeric Answer

x(t) = 691.4857 cos(300 t + 33.1229°)

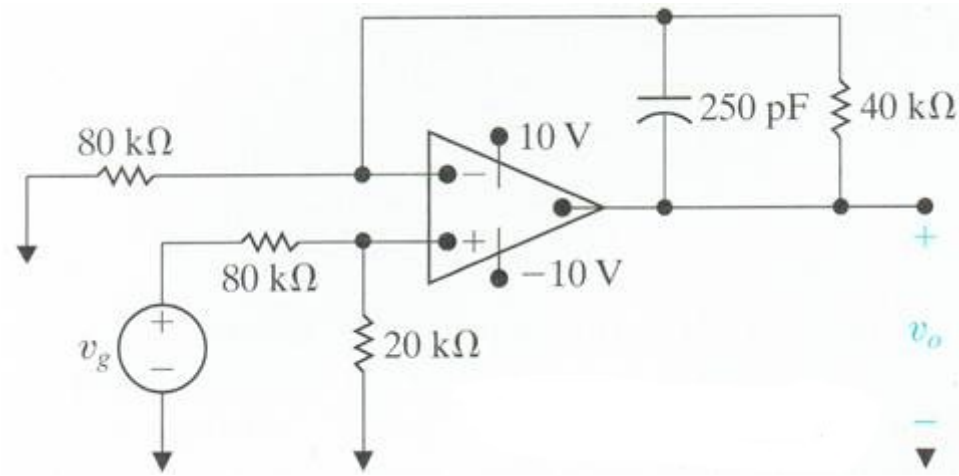
Incorrect

Marks for this submission: 0.00/10.00.

Question 3

Correct

Mark 15.00 out of 15.00



Q3e

Assume the operational amplifier is ideal.

Given $v_g(t) = 30.0$ V (a constant voltage)

Find the steady-state output $v_0(t)$.

$v_0(t)$ = 9 ✓ Volts

Numeric Answer

$v_0(t) = 9.0$ V since the opamp is in the linear region.

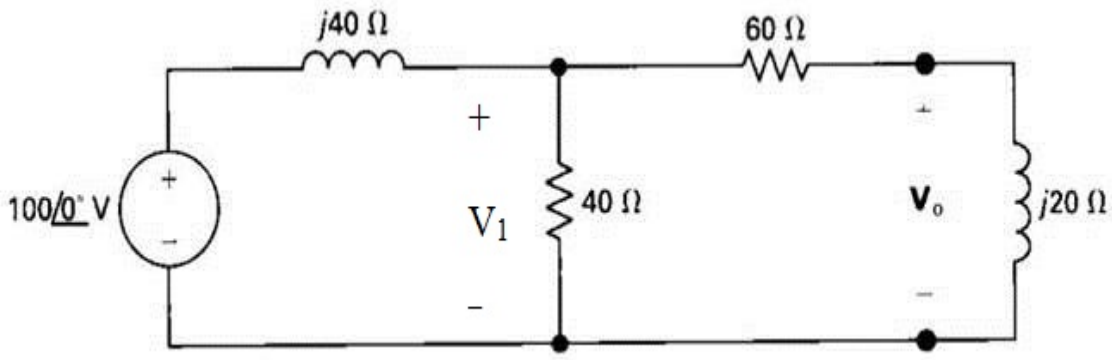
Correct

Marks for this submission: 15.00/15.00.

Question 4

Correct

Mark 15.00 out of 15.00



Q4a

Find the phasor voltages V_0 and V_1. I suggest you use the Node Method.

V_0 = 15.8 ✓ at angle 18.63 ✓ ° (Degrees) Volts

V_1 = 50 ✓ at angle -53.13 ✓ ° (Degrees) Volts

Express your answer as a positive magnitude and then the angle in the appropriate quadrant.

Numeric Answer

V_0 = 15.811 at angle 18.43° Volts

V_1 = 50.0 at angle -53.13° Volts

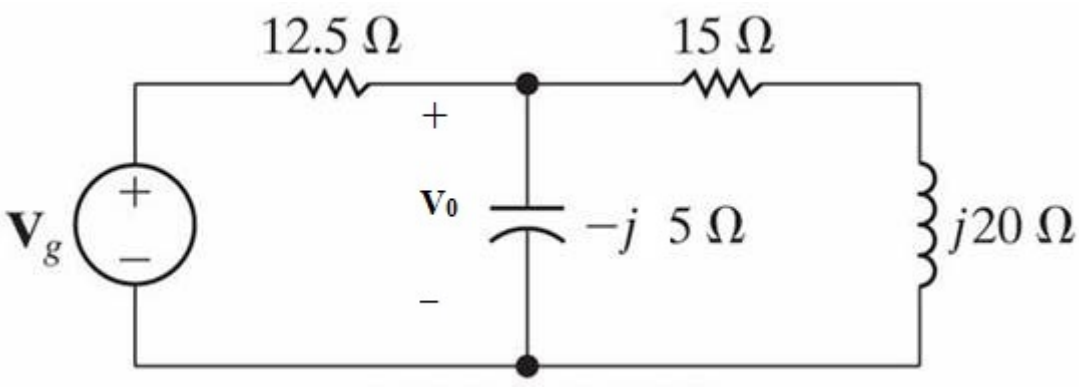
Correct

Marks for this submission: 15.00/15.00.

Question 5

Correct

Mark 15.00 out of 15.00



Q5b

Given:

The voltage source V_g = 160 at angle 0° V_{rms}

and the voltage V_0 = 64.7821 at angle -58.24° V_{rms}.

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

S_g = -1611.3 ✓ + j 705.04 ✓ VA

"+" = absorbed and "-" = delivered

Numeric Answer

S_g = -1,611.5346 + j 705.0451 VA

Correct

Marks for this submission: 15.00/15.00.

Question 6

Correct

Mark 5.00 out of 5.00

Q6b

What is the phase sequence of each of the following sets of voltages?

v_a = 820 cos(ωt -46°) V v_b = 820 cos(ωt + 74°) V v_c = 820 sin(ωt - 76°) V

acb – Negative Phase Sequence: ▾ ✓

Correct answer is acb – Negative Phase Sequence

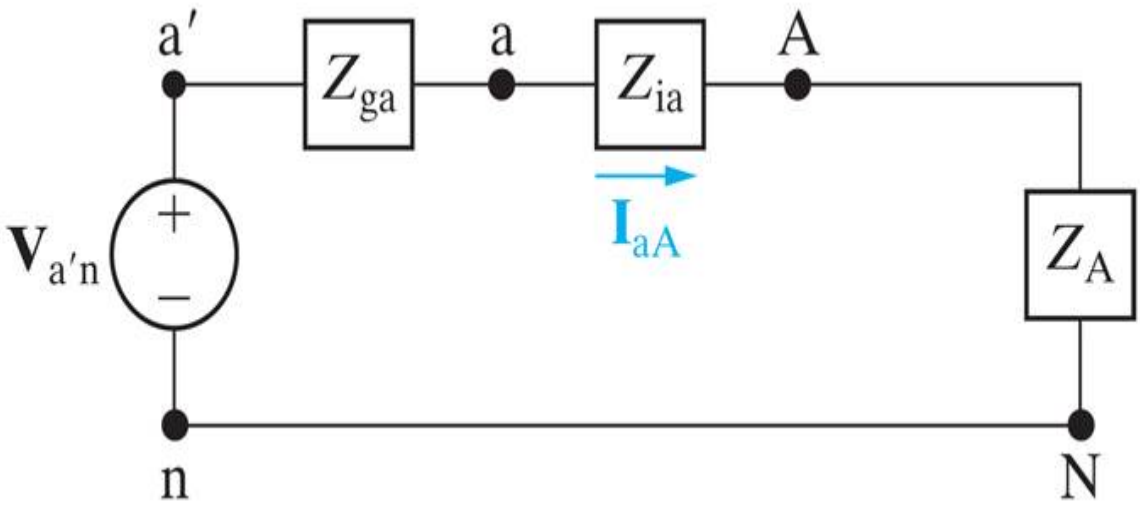
Correct

Marks for this submission: 5.00/5.00.

Question 7

Correct

Mark 15.00 out of 15.00



Q7c

Given: $V_{a'n}$ = 160 at angle 20º V_{rms} in a balanced three phase system with a positive phase sequence.

The source and load are Y connected.

Z_{ga} = 1 + j 15 Ω Z_{ia} = 20 + j 6 Ω Z_A = 9 + j 9 Ω

Calculate the single phase equivalent line currents I_{aA}, I_{bB} and I_{cC}.

I_{aA} = 3.77 ✓ at angle -25 ✓ ° (Degrees) A_{rms}

I_{bB} = 3.77 ✓ at angle -145 ✓ ° (Degrees) A_{rms}

I_{cC} = 3.77 ✓ at angle 95 ✓ ° (Degrees) A_{rms}

Calculate the line to line voltages V_{AB}, V_{BC}, and V_{CA}.

V_{AB} = 83.12 ✓ at angle 50 ✓ ° (Degrees) V_{rms}

V_{BC} = 83.12 ✓ at angle -70 ✓ ° (Degrees) V_{rms}

V_{CA} = 83.12 ✓ at angle 170 ✓ ° (Degrees) V_{rms}

I_{aA} = 3.7712 at angle -25° A_{rms}

I_{bB} = 3.7712 at angle -145° A_{rms}

I_{cC} = 3.7712 at angle 95° A_{rms}

V_{AB} = 83.1384 at angle 50° V_{rms}

V_{BC} = 83.1384 at angle -70° V_{rms}

V_{CA} = 83.1384 at angle 170° V_{rms}

Correct

Marks for this submission: 15.00/15.00.

Question 8

Correct

Mark 15.00 out of 15.00

Q8c

The total apparent power supplied in a balanced three-phase Y-Δ (wye to delta) system is 3,600 VA. The source line to neutral voltage is 240 V_{rms}. The line impedance is negligible and the power factor angle of the load is 25° leading.

Determine the impedance of each phase of the delta-connected load.

$Z_{\Delta,load}$ = 130.5 ✓ + j -60.86 ✓ Ω (Ohms)

$Z_{\Delta,load}$ = 130.5083 - j 60.8570 Ω (Ohms)

Correct

Marks for this submission: 15.00/15.00.

◄ Quiz 3 - Chapter 10

Jump to...

Quiz 4 - Chapter 12 ►