Started on	Wednesday, 20 February 2019, 10:55 AM
State	Finished
Completed on	Wednesday, 20 February 2019, 11:40 AM
Time taken	45 mins 47 secs
Grade	**100.00** out of 100.00

Question 1

Correct

Mark 10.00 out of 10.00

Q1e

Consider the sinusoidal voltage $v(t) = 460 \cos(880 \pi t + 75°)$ V_{rms}.

a) What is the maximum amplitude of the voltage?

$V_m =$ 650.54 ✓ V

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

f = 440 ✓ Hz

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

ω = 2764.6 ✓ rad/sec

d) What is the phase angle in radians?

φ (phi) = 1.31 ✓ radians

e) What is the period in milliseconds?

T = 2.27 ✓ ms (milli sec)

Numeric Answer

a) V_m = 650.5382 V

b) f = 440 Hz

c) ω = 2,764.602 rad/sec

d) φ (phi) = 1.3090 radians

e) T = 2.2727 ms (milli sec)

Correct

Marks for this submission: 10.00/10.00.

Question 2

Correct

Mark 10.00 out of 10.00

Q2c

Given: $x(t) = 250 \cos(300\,t + 30°) + 350 \cos(300\,t - 50°)$

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) = 464 ✓

Angle θ of x(t) = -17.96 ✓ ° (Degree)

$x(t) = 464.0996 \cos(300\,t - 17.9612°)$

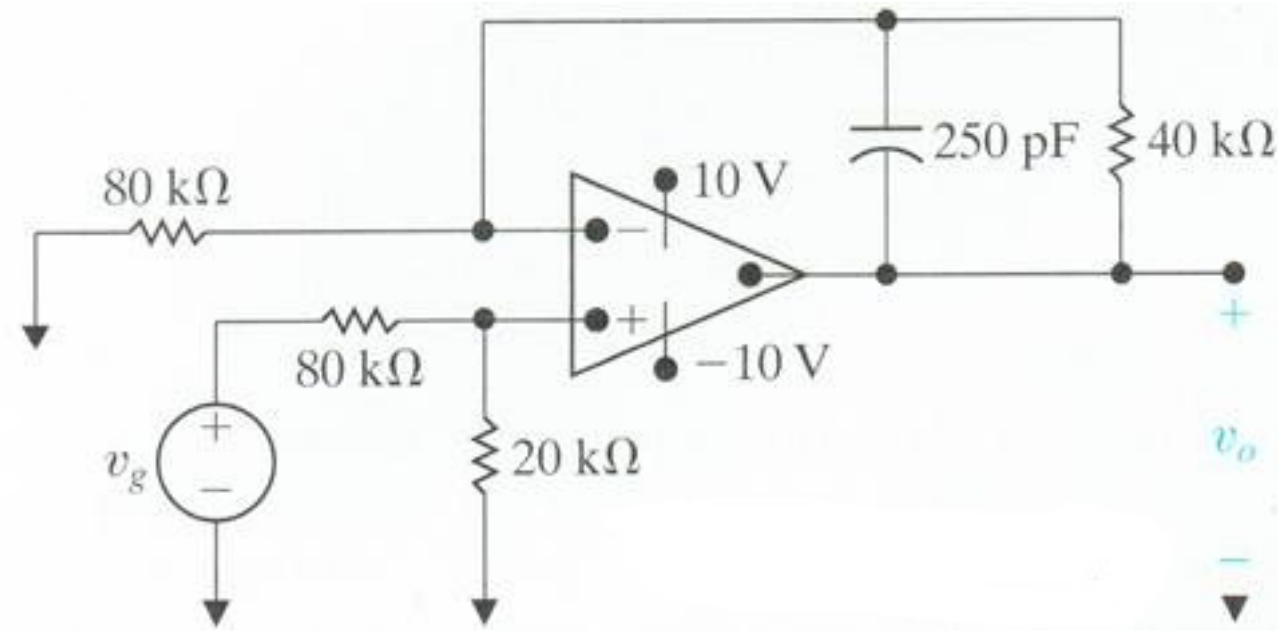
Correct

Marks for this submission: 10.00/10.00.

Question 3

Correct

Mark 15.00 out of 15.00



Q3a

Assume the operational amplifier is ideal.

Given $v_g(t) = 34.50$ V (a constant voltage)

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

$v_0(t) =$ 10 ✓ Volts

Numeric Answer

$v_0(t) = 10$ V since the opamp is in saturation at the positive power supply rail.

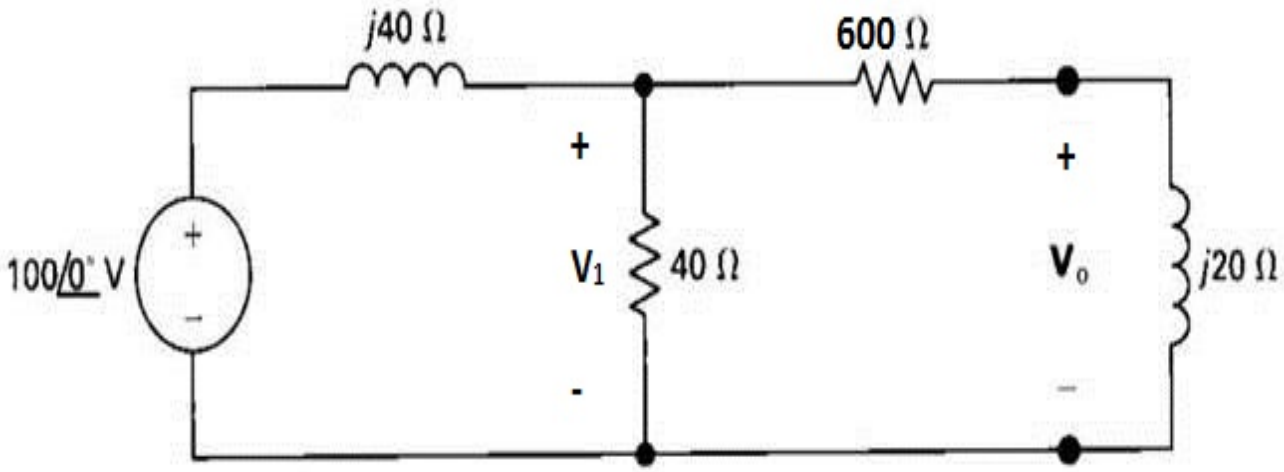
Correct

Marks for this submission: 15.00/15.00.

Question 4

Correct

Mark 15.00 out of 15.00



Q4c

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

V_0 = 2.3 ✓ at angle 41 ✓ ° (Degrees) Volts

V_1 = 69.4 ✓ at angle -46.8 ✓ ° (Degrees) Volts

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

Numeric Answer

V_0 = 2.2763 at angle 41.31° Volts

V_1 = 68.3256 at angle -46.78° Volts

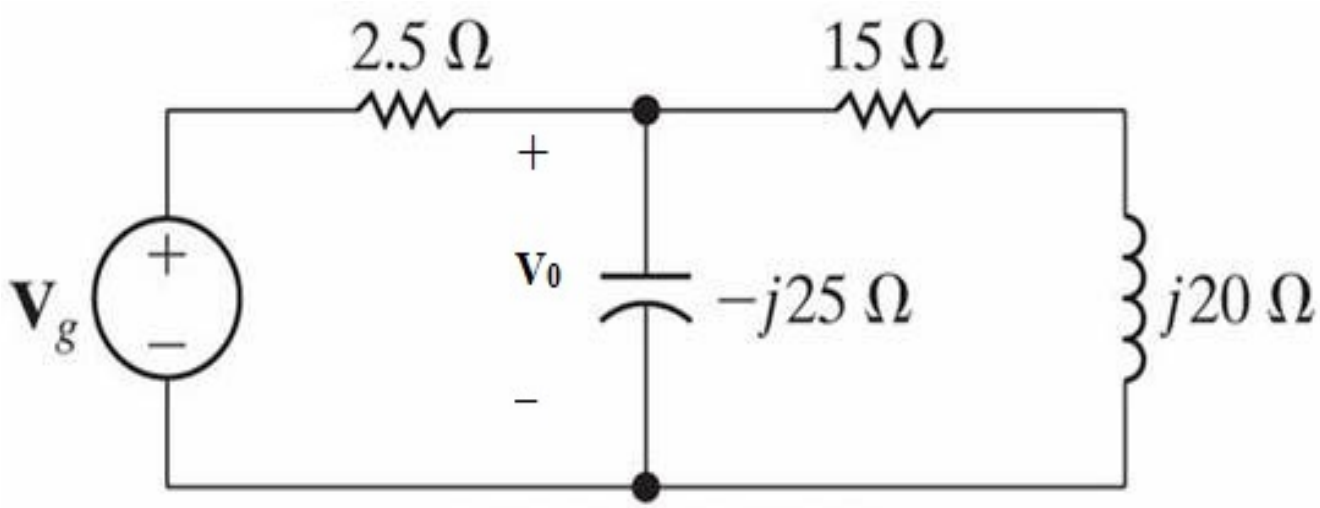
Correct

Marks for this submission: 15.00/15.00.

Question 5

Correct

Mark 15.00 out of 15.00



Q5c

Given:

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

and the voltage V_0 = 150.9165 at angle -1.08° V_{rms}.

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

S_g = -583 ✓ + j 182 ✓ VA

"+" = absorbed and "-" = delivered

Numeric Answer

S_g = -583.0605 + j 182.2064 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?

$v_a = 820 \cos(\omega t - 46°)$ V $v_b = 820 \cos(\omega t + 74°)$ V $v_c = 820 \sin(\omega t - 76°)$ V

acb – Negative Phase Sequence: ▼

Correct answer is acb – Negative Phase Sequence

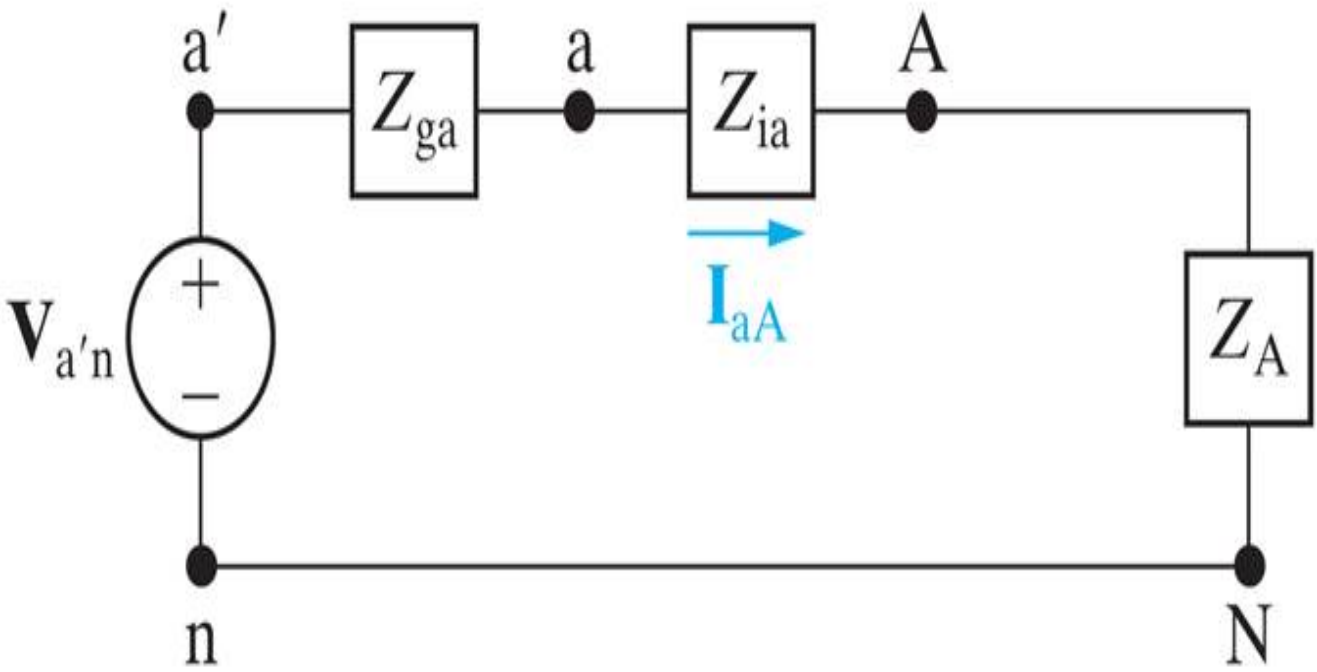
Correct

Marks for this submission: 5.00/5.00.

Question 7

Correct

Mark 15.00 out of 15.00



Q7a

Given: $V_{a'n}$ = 120 at angle 0º V_{rms} in a balanced three phase system with a positive phase sequence.

The source and load are Y connected.

Z_{ga} = 1 + j15 Ω Z_{ia} = 19 + j5 Ω Z_A = 20 + j20 Ω

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

I_{aA} = 2.12 ✓ at angle -45 ✓ ° (Degrees) A_{rms}

I_{bB} = 2.12 ✓ at angle -165 ✓ ° (Degrees) A_{rms}

I_{cC} = 2.12 ✓ at angle 75 ✓ ° (Degrees) A_{rms}

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

V_{AB} = 103.9 ✓ at angle 30 ✓ ° (Degrees) V_{rms}

V_{BC} = 103.9 ✓ at angle -90 ✓ ° (Degrees) V_{rms}

V_{CA} = 103.9 ✓ at angle 150 ✓ ° (Degrees) V_{rms}

I_{aA} = 2.1213 at angle -45° A_{rms}

I_{bB} = 2.1213 at angle -165° A_{rms}

I_{cC} = 2.1213 at angle 75° A_{rms}

V_{AB} = 103.923 at angle 30° V_{rms}

V_{BC} = 103.923 at angle -90° V_{rms}

V_{CA} = 103.923 at angle 150° 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 -60.9 ✓ 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 ►