

ENGG104 Tutorial 10 extra **Problems** (revision)

Name_____

Student Number_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

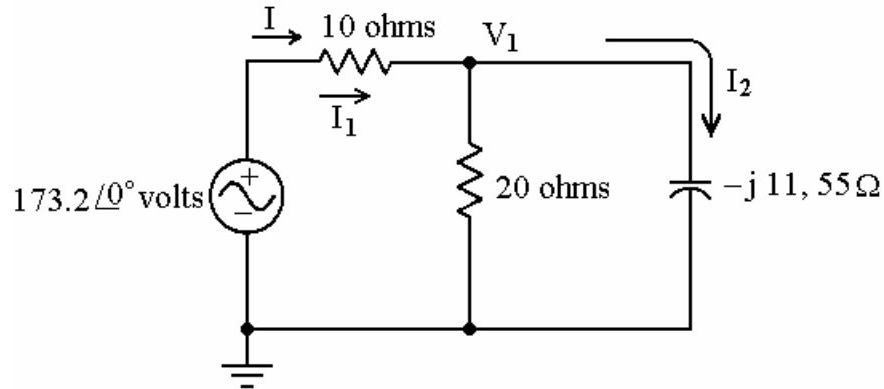


Figure 16.9

- 1) For the circuit shown in Figure 16.9, the current flowing through the 20 Ω resistor is
 A) $10 \angle 30^\circ$ B) $173.2 \angle 0^\circ$ C) $8.66 \angle 60^\circ$ D) $5 \angle -30^\circ$

1) _____

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

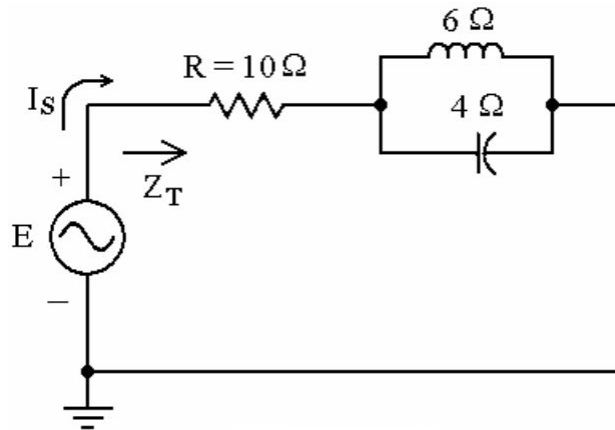


Figure 16.1

- 2) See Figure 16.1. The current divider rule can be applied to determine the current through the capacitor.

2) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

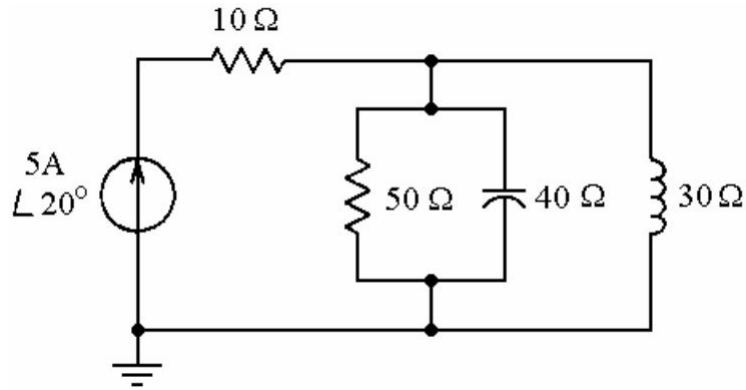


Figure 16.7

- 3) Describe how PSpice (Windows) can be used to solve for Z_T in the circuit shown in Figure 16.7. 3) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

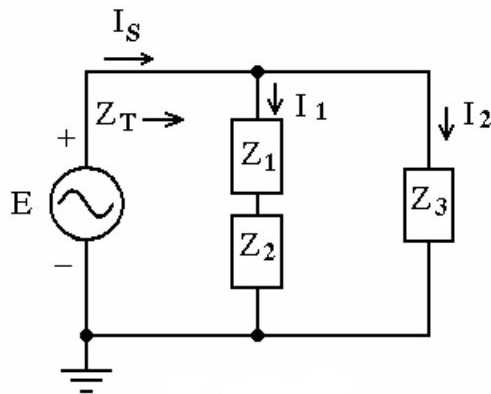


Figure 16.3

- 4) See Figure 16.3. Which one equation describes the total impedance Z_T for this circuit? 4) _____
- A) $Z_T = (Z_1 \parallel Z_2) \parallel Z_3$ B) $Z_T = (Z_1 + Z_2) \parallel Z_3$
 C) $Z_T = Z_1 + Z_2 + Z_3$ D) $Z_T = Z_1 + Z_2 - Z_3$

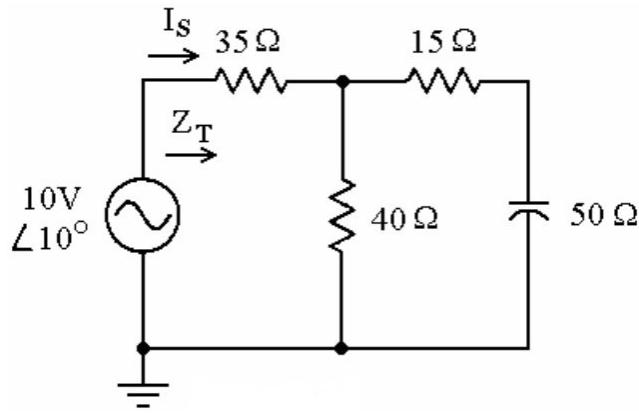


Figure 16.6

5) See Figure 16.6. What is the total impedance Z_T ?

- A) $17.1 \Omega \angle -33.2^\circ$ B) $60.8 \Omega \angle -13.8^\circ$ C) $39.2 \Omega \angle -30.7^\circ$ D) $49.3 \Omega \angle -9.4^\circ$

5) _____

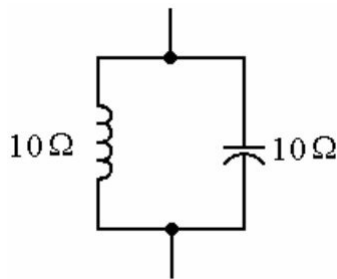


Figure 16.2

6) See Figure 16.2. What is the total impedance Z_T for this circuit?

- A) $5 \Omega \angle 0^\circ$ B) $0 \Omega \angle 0^\circ$ C) $100 \Omega \angle 0^\circ$ D) infinity

6) _____

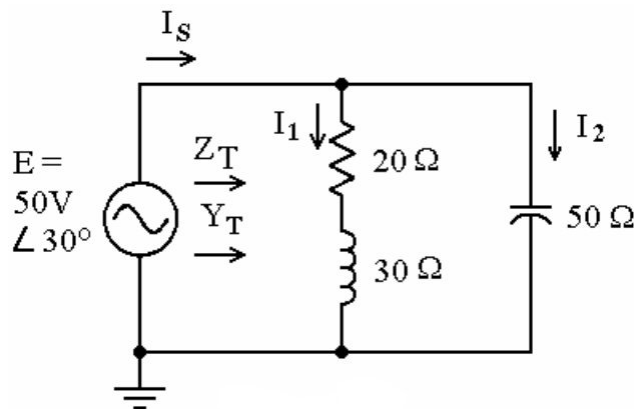


Figure 16.5

7) See Figure 16.5. What is the total admittance Y_T of this circuit?

- A) $0.028 \text{ S} \angle -56.3^\circ$ B) $0.02 \text{ S} \angle 90^\circ$ C) $63.73 \text{ S} \angle 11.3^\circ$ D) $0.016 \text{ S} \angle -11.3^\circ$

7) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

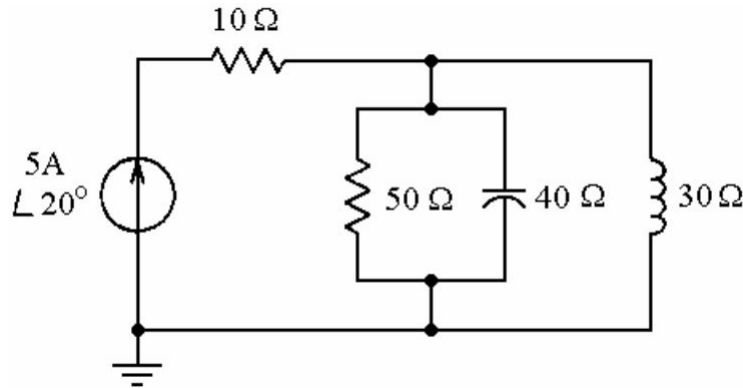


Figure 16.7

8) See Figure 16.7. Find the voltage across the coil.

8) _____

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

9) For parallel current sources, the equivalent current source is their sum or difference.

9) _____

10) The higher the frequency, the better the short-circuit approximation for X_C for ac conditions.

10) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

11) For many single source, series-parallel networks, the analysis is one that works back to the source, determines the _____, and then finds its way to the desired unknown.

11) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

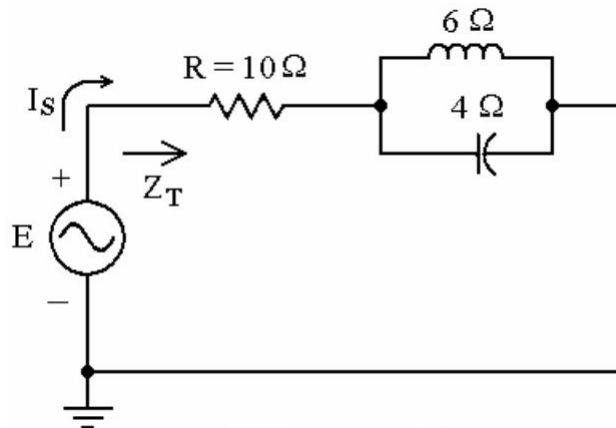


Figure 16.1

12) A 1 kHz signal E is applied in the circuit shown in Figure 16.1. What is the value of inductor L?
A) 1910 μH B) 26.5 μH C) 1047 μH D) 955 μH

12) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

13) Series-parallel ac networks may contain any number of elements whose impedance is dependent on the applied _____.

13) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

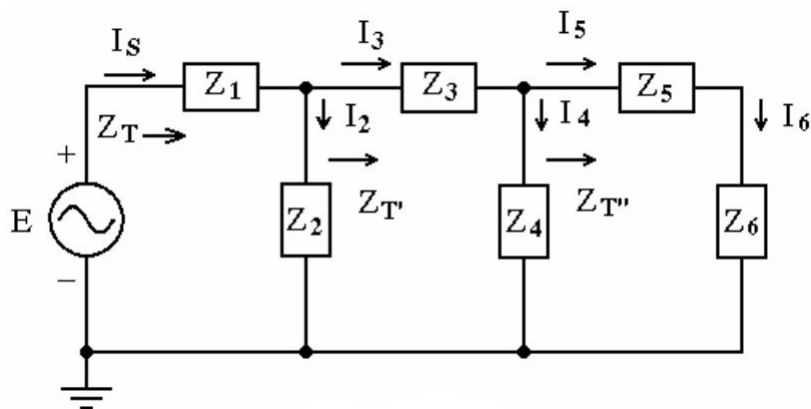


Figure 16.4

14) See Figure 16.4. Which one equation describes the total impedance Z_T ?

14) _____

A) $Z_T = Z_1 + Z_T'$

B) $Z_T = Z_1 + (Z_2 \parallel Z_T')$

C) $Z_T = Z_1 \parallel Z_2$

D) $Z_T = Z_1 + Z_3 + Z_5 + Z_6'$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

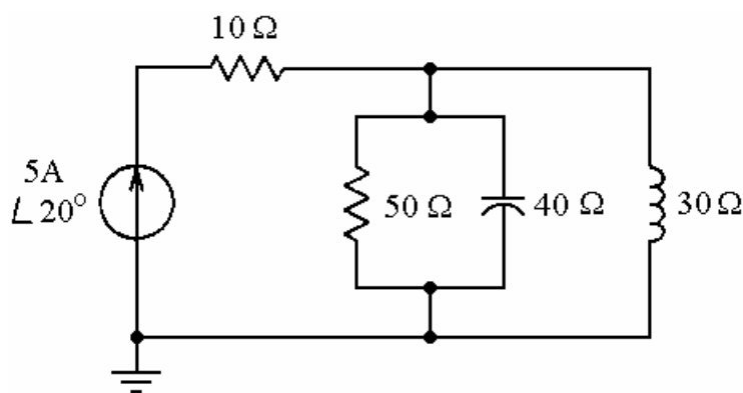


Figure 16.7

15) See Figure 16.7. Compute the total circuit impedance Z_T .

15) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

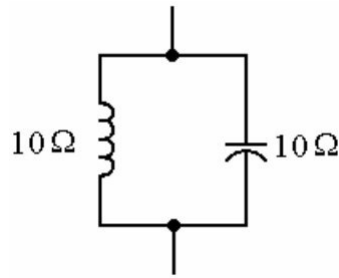


Figure 16.2

- 16) See Figure 16.2. As the frequency increases, the total impedance Z_T of this circuit 16) _____
 A) increases, approaching infinity. B) becomes more inductive.
 C) becomes more capacitive. D) becomes more resistive.

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 17) The advantage of ladder networks is that it is not necessary to know total impedance to be able to 17) _____
 determine total current.
- 18) Combining the impedance of more than one element can be of value in determining the total 18) _____
 voltage across a series combination.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

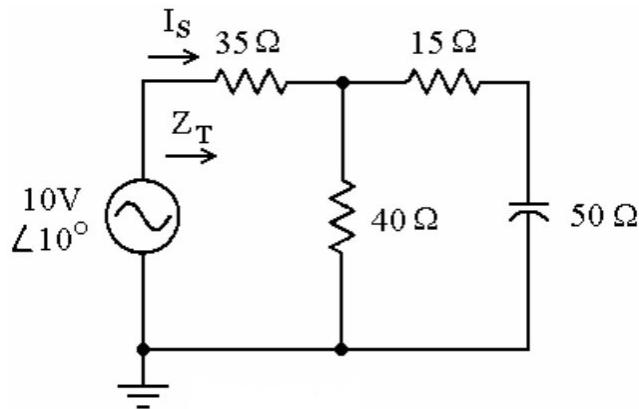


Figure 16.6

- 19) See Figure 16.6. What is the total current I_s ? 19) _____
 A) 5.0 A $\angle 23.8^\circ$ B) 502 A $\angle -10.7^\circ$ C) 5.0 A $\angle -10.7^\circ$ D) 0.164 A $\angle 23.8^\circ$

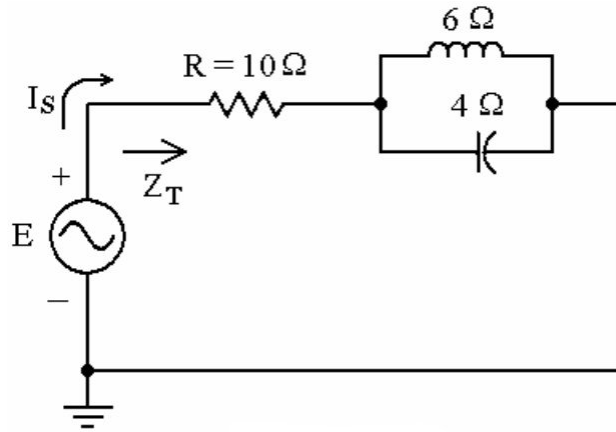


Figure 16.1

- 20) See Figure 16.1. What is the total impedance Z_T of this circuit? 20) _____
 A) $10\ \Omega - j2.4\ \Omega$ B) $10\ \Omega + j12\ \Omega$ C) $10\ \Omega - j2\ \Omega$ D) $10\ \Omega - j12\ \Omega$

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

- 21) Unknown voltages in series-parallel ac networks can be across only passive elements. 21) _____
 22) The fundamental concept for solving series-parallel ac networks is different from solving series-parallel dc networks. 22) _____
 23) The equivalent circuit is used in determining the source current in series-parallel ac networks. 23) _____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

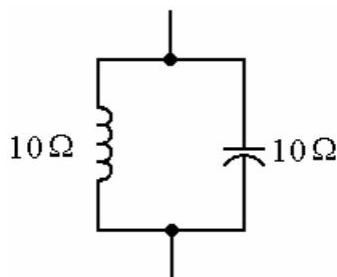


Figure 16.2

- 24) See Figure 16.2. If $L = 10\text{ mH}$, what is the applied frequency? What is the value of the capacitor? 24) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

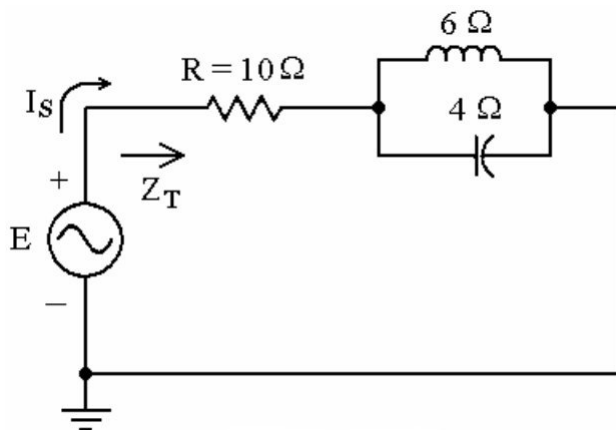


Figure 16.1

25) See Figure 16.1. If $I_S = 1 \text{ A} \angle 80^\circ$, what is the current through the coil?

A) $2 \text{ A} \angle -100^\circ$

B) $2 \text{ A} \angle 100^\circ$

C) $0.5 \text{ A} \angle -100^\circ$

D) $0.5 \text{ A} \angle 100^\circ$

25) _____

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

26) Determining the source current is the most critical step in solving series-parallel ac networks.

26) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

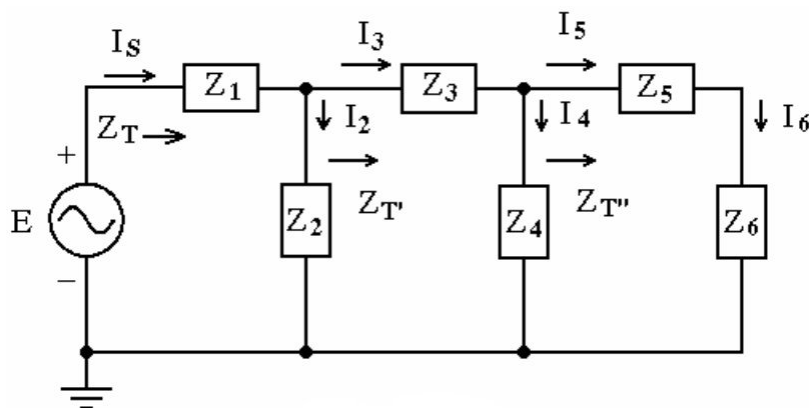


Figure 16.4

27) See Figure 16.4. Which one of these statements is true?

A) $I_4 = I_6$

B) $I_3 = I_2 + I_5$

C) $I_S = I_3$

D) $I_3 = I_4 + I_6$

27) _____

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

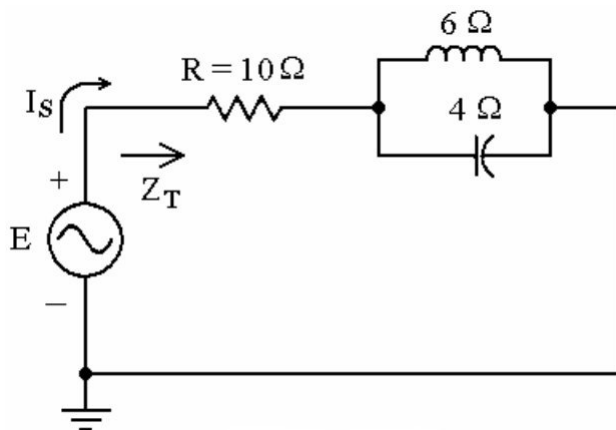


Figure 16.1

28) See Figure 16.1. The total impedance Z_T of this circuit is independent of the applied frequency. 28) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

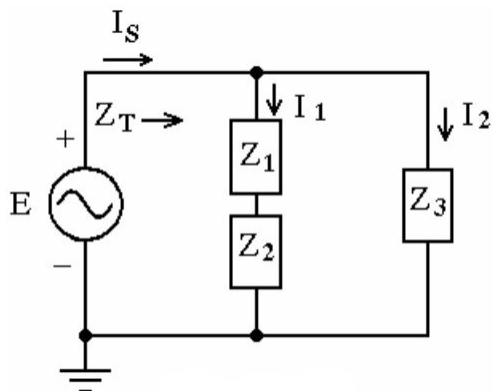


Figure 16.3

29) See Figure 16.3. Which one equation describes source voltage E ? 29) _____
 A) $E = I_S^2 Z_T$ B) $E = I_S Z_T$ C) $E = I_S \div Z_T$ D) $E = Z_T \div I_S$