

Is X_C proportional or inversely proportional to the frequency, f ?

Refer to Fig. 17-18b. With the frequency, f , set to 500 Hz, calculate and record the value of X_C for each of the following capacitance values listed below. Calculate X_C as $1/(2\pi fC)$.

$X_C =$ _____ when $C = 0.1 \mu\text{F}$
 $X_C =$ _____ when $C = 0.22 \mu\text{F}$
 $X_C =$ _____ when $C = 0.47 \mu\text{F}$

Connect the circuit in Fig. 17-18b. Adjust the frequency of the function generator to exactly 500 Hz. For each of the following capacitance values listed below, measure and record the current, I . (Use a DMM to measure I .) Next, calculate X_C as V/I .

$I =$ _____ when $C = 0.1 \mu\text{F}$; $X_C =$ _____
 $I =$ _____ when $C = 0.22 \mu\text{F}$; $X_C =$ _____
 $I =$ _____ when $C = 0.47 \mu\text{F}$; $X_C =$ _____

Is X_C proportional or inversely proportional to the value of capacitance? _____

Series Capacitive Reactances

Refer to the circuit in Fig. 17-19a. Calculate and record the following values:

$X_{C_1} =$ _____, $X_{C_2} =$ _____, $X_{C_T} =$ _____, $I =$ _____,
 $V_{C_1} =$ _____, $V_{C_2} =$ _____

Do V_{C_1} and V_{C_2} add to equal V_T ?

Construct the circuit in Fig. 17-19a. Set the frequency of the function generator to exactly 500 Hz. Next, using a DMM, measure and record the following values:

$I =$ _____, $V_{C_1} =$ _____, $V_{C_2} =$ _____

Using the measured values of voltage and current, calculate the following values:

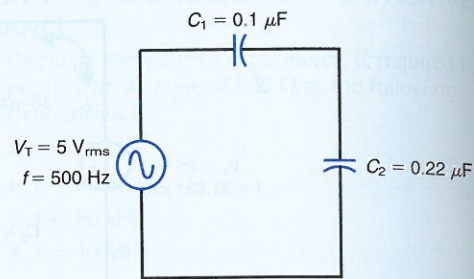
$X_{C_1} =$ _____, $X_{C_2} =$ _____, $X_{C_T} =$ _____

Are the experimental values calculated here close to those initially calculated above? _____

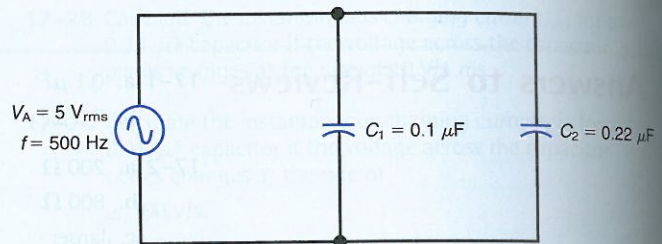
Parallel Capacitive Reactances

Refer to the circuit in Fig. 17-19b. Calculate and record the following values:

Figure 17-19



(a)



(b)

$X_{C_1} =$ _____, $X_{C_2} =$ _____, $I_{C_1} =$ _____, $I_{C_2} =$ _____,
 $I_T =$ _____, $X_{C_{EQ}} =$ _____

Do I_{C_1} and I_{C_2} add to equal I_T ? _____

Construct the circuit in Fig. 17-19b. Set the frequency of the function generator to exactly 500 Hz. Next, using a DMM, measure and record the following values:

$I_{C_1} =$ _____, $I_{C_2} =$ _____, $I_T =$ _____

Using the measured values of voltage and current, calculate the following values:

$X_{C_1} =$ _____, $X_{C_2} =$ _____, $X_{C_{EQ}} =$ _____

Are the experimental values calculated here close to those initially calculated above? _____