

Series Inductive Reactances

Refer to the circuit in Fig. 20-18a. Calculate and record the following values:

$$X_{L_1} = \underline{\hspace{2cm}}, X_{L_2} = \underline{\hspace{2cm}}, X_{L_T} = \underline{\hspace{2cm}},$$

$$I = \underline{\hspace{2cm}}, V_{L_1} = \underline{\hspace{2cm}}, V_{L_2} = \underline{\hspace{2cm}}$$

Do V_{L_1} and V_{L_2} add to equal V_T ?

Construct the circuit in Fig. 20-18a. Set the frequency of the function generator to exactly 5 kHz. Next, using a DMM, measure and record the following values:

$$I = \underline{\hspace{2cm}}, V_{L_1} = \underline{\hspace{2cm}}, V_{L_2} = \underline{\hspace{2cm}}$$

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

$$X_{L_1} = \underline{\hspace{2cm}}, X_{L_2} = \underline{\hspace{2cm}}, X_{L_T} = \underline{\hspace{2cm}}$$

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

Parallel Inductive Reactances

Refer to the circuit in Fig. 20-18b. Calculate and record the following values:

$$X_{L_1} = \underline{\hspace{2cm}}, X_{L_2} = \underline{\hspace{2cm}}, I_{L_1} = \underline{\hspace{2cm}},$$

$$I_{L_2} = \underline{\hspace{2cm}}, I_T = \underline{\hspace{2cm}}, X_{L_{EQ}} = \underline{\hspace{2cm}}$$

Do I_{L_1} and I_{L_2} add to equal I_T ?

Construct the circuit in Fig. 20-18b. Set the frequency of the function generator to exactly 5 kHz. Next, using a DMM, measure and record the following values:

$$I_{L_1} = \underline{\hspace{2cm}}, I_{L_2} = \underline{\hspace{2cm}}, I_T = \underline{\hspace{2cm}}$$

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

$$X_{L_1} = \underline{\hspace{2cm}}, X_{L_2} = \underline{\hspace{2cm}}, X_{L_{EQ}} = \underline{\hspace{2cm}}$$

Are the experimental values calculated here similar to those initially calculated?

Figure 20-18

