

46. Four possibilities exist: (1)  $C_1 = 4.00 \mu\text{F}$  is used alone; (2)  $C_2 = 6.00 \mu\text{F}$  is used alone; (3)  $C_1$  and  $C_2$  are connected in series; and (4)  $C_1$  and  $C_2$  are connected in parallel. The corresponding resonant frequencies are

$$f_1 = \frac{1}{2\pi\sqrt{LC_1}} = \frac{1}{2\pi\sqrt{(2.00 \times 10^{-3} \text{ H})(4.00 \times 10^{-6} \text{ F})}} = 1.78 \times 10^3 \text{ Hz}$$

$$f_2 = \frac{1}{2\pi\sqrt{LC_2}} = \frac{1}{2\pi\sqrt{(2.00 \times 10^{-3} \text{ H})(6.00 \times 10^{-6} \text{ F})}} = 1.45 \times 10^3 \text{ Hz}$$

$$f_3 = \frac{1}{2\pi\sqrt{LC_1C_2/(C_1 + C_2)}} = 2.30 \times 10^3 \text{ Hz}$$

$$f_4 = \frac{1}{2\pi\sqrt{L(C_1 + C_2)}} = 1.13 \times 10^3 \text{ Hz} .$$