

14. The capacitors C_1 and C_2 can be used in four different ways: (1) C_1 only; (2) C_2 only; (3) C_1 and C_2 in parallel; and (4) C_1 and C_2 in series. The corresponding oscillation frequencies are:

$$f_1 = \frac{1}{2\pi\sqrt{LC_1}} = \frac{1}{2\pi\sqrt{(1.0 \times 10^{-2} \text{ H})(5.0 \times 10^{-6} \text{ F})}} = 7.1 \times 10^2 \text{ Hz}$$

$$f_2 = \frac{1}{2\pi\sqrt{LC_2}} = \frac{1}{2\pi\sqrt{(1.0 \times 10^{-2} \text{ H})(2.0 \times 10^{-6} \text{ F})}} = 1.1 \times 10^3 \text{ Hz}$$

$$f_3 = \frac{1}{2\pi\sqrt{L(C_1 + C_2)}} = \frac{1}{2\pi\sqrt{(1.0 \times 10^{-2} \text{ H})(2.0 \times 10^{-6} \text{ F} + 5.0 \times 10^{-6} \text{ F})}} = 6.0 \times 10^2 \text{ Hz}$$

$$\begin{aligned} f_4 &= \frac{1}{2\pi\sqrt{LC_1C_2/(C_1 + C_2)}} = \frac{1}{2\pi} \sqrt{\frac{2.0 \times 10^{-6} \text{ F} + 5.0 \times 10^{-6} \text{ F}}{(1.0 \times 10^{-2} \text{ H})(2.0 \times 10^{-6} \text{ F})(5.0 \times 10^{-6} \text{ F})}} \\ &= 1.3 \times 10^3 \text{ Hz} \end{aligned}$$