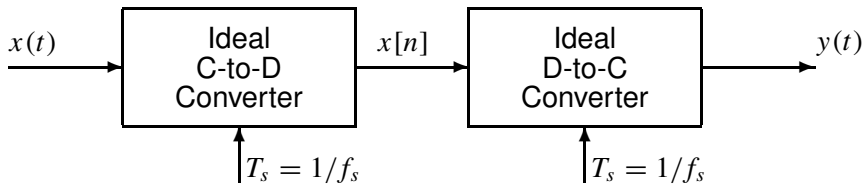**PROBLEM:**

Shown in the figure above is an ideal C-to-D converter that samples $x(t)$ with a sampling period T_s to produce the discrete-time signal $x[n]$. The ideal D-to-C converter then forms a continuous-time signal $y(t)$ from the samples $x[n]$. Suppose that $x(t)$ is given by

$$x(t) = [15 + 30\sin(250\pi t)]\cos(1000\pi t)$$

(a) Sketch the two-sided spectrum of this signal. Be sure to label important features of the plot.
   Hint: Recall the AM spectrum from a previous homework set.

(b) Is this waveform periodic? If so, what is the period?

(c) What is the minimum sampling rate f_s that can be used in the above system so that $y(t) = x(t)$?