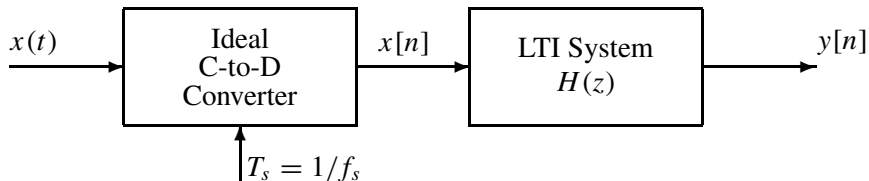**PROBLEM:**

The input to the C-to-D converter in the above system is

$$x(t) = 100 + 50\cos(1000\pi t - \pi/4)$$

The sampling frequency is $f_s = 2000$ samples/second. The LTI system is an L-point moving averager defined by the equation

$$y[n] = \frac{1}{L}\sum_{k=0}^{L-1} x[n-k]$$

(a) Is it possible to find a value of L such that $y[n] = A$ for $-\infty < n < \infty$, where A is a constant? If so, give a rough outline of your plan for finding L.

(b) Determine the *minimum* value of L such that the cosine term is removed as specified in part (a). Also determine the value of the constant A for your system in part (a).

$$L_{min} = \boxed{}$$ $$A = \boxed{}$$