PROBLEM:

Circle the correct answer to each of these short answer questions (3 pts. each):

1. A signal $x(t)$ is defined by: $x(t) = \cos(1000\pi t - 1.3\pi)$. Its shortest period ($T$) is

   (a) $T = 1000$ sec.

   (b) $T = 1$ sec.

   (c) $T = 10^{-3}$ sec.

   (d) $T = 2 \times 10^{-3}$ sec.

   (e) none of the above

2. A signal $x(t)$ is defined by: $x(t) = 7\sin(3\pi t - \frac{1}{2}\pi)$. A valid complex exponential representation for $x(t)$ is:

   (a) $x(t) = \Re e\{14e^{-j\pi}e^{j3\pi t}\}$

   (b) $x(t) = \Re e\{7e^{j\pi}e^{j3\pi t}\}$

   (c) $x(t) = \Re e\{7e^{-j0.5\pi}e^{j3\pi t}\}$

   (d) $x(t) = \Re e\{7e^{j3\pi}e^{j\pi t}\}$

   (e) none of the above

3. When the following two sinusoids are combined: $\cos(6t + \pi/3) + \cos(6t - \pi/3)$, determine the amplitude (A) and phase (ϕ) of the resulting sinusoid.

   (a) $A = 1$ and $\phi = 0$.

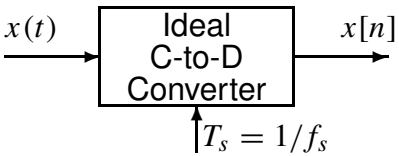
   (b) $A = 1$ and $\phi = \pi/3$.

   (c) $A = 1$ and $\phi = -\pi/3$.

   (d) $A = \sqrt{3}$ and $\phi = 0$.

   (e) none of the above

4. If the input to an ideal C/D converter is a sinusoid with frequency of 2500 Hz, and the output is the discrete-time sinusoid: $x[n] = 4\cos(\frac{1}{2}\pi n)$, then



   determine the possible value(s) of the sampling frequency f_s:

   (a) $f_s = 10,000$ Hz

   (b) $f_s = 2000$ Hz

   (c) $f_s = 400$ Hz

   (d) all of the above

   (e) none of the above