PROBLEM:

Circle the correct answer to each of these short answer questions:

1. A signal $x(t)$ is defined by: $x(t) = \Re\{(1 + j)e^{j\pi t}\}$. Its shortest period (T) is

   (a) $T = 0.5$ sec.

   (b) $T = 1$ sec.

   (c) $T = 2$ sec.

   (d) $T = \pi$ sec.

   (e) none of the above

2. A sinusoidal signal $x(t)$ is defined by: $x(t) = \Re\{(1 + j)e^{j\pi t}\}$. When plotted versus time (t), its maximum value will be:

   (a) $A = 1 + j$

   (b) $A = \sqrt{2}$

   (c) $A = 1$

   (d) $A = 0$

   (e) none of the above

3. Determine the amplitude (A) and phase (ϕ) of the sinusoid that is the sum of the following three sinusoids: $10\cos(6t + \pi/2) + 7\cos(6t - \pi/6) + 7\cos(6t + 7\pi/6)$,

   (a) $A = 3$ and $\phi = 0$.

   (b) $A = 3$ and $\phi = \pi/2$.

   (c) $A = 10$ and $\phi = \pi/2$.

   (d) $A = 7$ and $\phi = \pi/2$.

   (e) $A = 24$ and $\phi = \pi/2$.

4. Evaluate the complex number $z = \dfrac{j^{-1} - j^{-2}}{j^{-3} + j^{-4}}$.

   (a) $z = -j$

   (b) $z = 1$

   (c) $z = 0$

   (d) $z = j$

   (e) $z = -1$