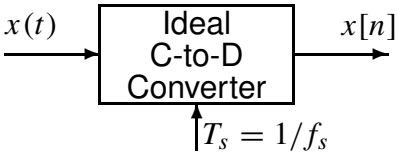
PROBLEM:

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

1. If the output from an ideal C/D converter is $x[n] = 3.14\cos(0.5\pi n)$, and the sampling rate is 20 samples/sec, then determine the possible value(s) of the the input frequency of $x(t)$:



   (a) $f = 0.5$ Hz
   (b) $f = 10$ Hz
   (c) $f = 20$ Hz
   (d) all of the above
   (e) none of the above

2. Determine the Nyquist rate for sampling the signal $x(t)$ defined by: $x(t) = \Re e\{e^{j12\pi t} + e^{j21\pi t}\}$.

   (a) $f_s = 12$ samples/sec.
   (b) $f_s = 10.5$ samples/sec.
   (c) $f_s = 21$ samples/sec.
   (d) $f_s = 33$ samples/sec.
   (e) none of the above

3. If the following MATLAB code is implemented, what is the frequency of the sound that will be produced at the output of the computer's D-to-A converter.

```
soundsc( cos(1.6*pi*(0:9999)), 2000);
```

   (a) 8000 Hz
   (b) 2000 Hz
   (c) 1600 Hz
   (d) 800 Hz
   (e) 400 Hz

4. A rotating disk with one spot is spinning *clockwise* at the rate of 10 revolutions per second. When the disk is illuminated with a strobe light that flashes at a constant rate, the spot appears to stand still. There are many possible correct values for the flashing rate. Circle all the ones that will make the disk appear to stand still.

   (a) The flashing rate is 1 flash per second.
   (b) The flashing rate is 2 flashes per second.
   (c) The flashing rate is 4 flashes per second.
   (d) The flashing rate is 10 flashes per second.
   (e) The flashing rate is 20 flashes per second.