

Music 147 / CompSci 190 — **Quiz 1** — Spring 2014

1. When an object vibrates, it creates periodic increases in air pressure called:
  - a) resonance
  - b) harmony
  - c) compression
  - d) rarefaction
  
2. The pair of frequencies that represents the pitch interval of an octave is:
  - a) 440 Hz and 660 Hz
  - b) 842 Hz and 843 Hz
  - c) 100 Hz and 108 Hz
  - d) 467 Hz and 934 Hz
  
3. In an audio editing program, if I mix two sounds, each having an amplitude of -3 dB:
  - a) there is a high likelihood that they will cancel each other out entirely
  - b) the resulting sound will have an amplitude of approximately -6 dB
  - c) the loudness will be the same, but their frequencies could exceed the Nyquist rate
  - d) the amplitude of the resulting sound might be greater than 0 dB, causing clipping
  
4. The sampling rate refers to:
  - a) how many times per second the sound wave repeats
  - b) how many bits are used per sample of the sound
  - c) how many numerical samples of the analog sound are taken each second
  - d) how many samples of delay there are between the input and the output
  
5. The Nyquist theorem states that:
  - a) the sampling rate must be at least half the highest sampled frequency
  - b) the sampling rate must be at least twice the highest sampled frequency
  - c) the sampling rate must be at least half the Nyquist frequency
  - d) the sampling rate must be at least as great as the highest sampled frequency
  
6. The word *timbre* is used to describe:
  - a) the capacitance of a microphone, determined by its mass
  - b) the tone color of an instrument, determined by its spectrum
  - c) the effect that occurs when two sine tones destructively interfere
  - d) a regularly repeating fluctuation of pitch, also known as vibrato
  
7. An immediate shift of amplitude from non-zero to 0 will usually be heard as:
  - a) a click
  - b) an aliased frequency
  - c) sustained low-level pink noise
  - d) a drop in perceived frequency
  
8. Using a lowpass filter on an audio signal:
  - a) is an example of frequency modulation
  - b) removes the low frequencies
  - c) is known as an LFO
  - d) diminishes the high frequencies

9. If an amplitude of 1 is used as a 0dB reference, the amplitude signified by "-6 dB" is
- 0.6
  - 0.5
  - 0.4
  - 0.166667
10. In digital recording, a lowpass filter is used before the analog-to-digital converter to:
- reduce low-frequency rumble (ambient room noise)
  - prevent distortion of the signal due to clipping
  - improve the precision of quantization
  - prevent aliasing
11. The sampling rate of compact disc recordings is:
- 44,100 Hz
  - 40,000 Hz
  - 31,250 Hz
  - 10,000 Hz
12. Most real-world sounds that we perceive as having a definite pitch:
- actually contain multiple frequencies in random relationships
  - contain a frequency that produces a timbre characterized as "inharmonic"
  - contain frequencies that are whole number multiples of a fundamental frequency
  - contain energy at only one specific frequency, permitting us to identify its pitch
13. Aliasing occurs when:
- the amplitude of the sound surpasses the electrical capability of the converter
  - a sound is heard in one ear, then a short time later in the other ear with lower volume
  - the sound contains frequencies that exceed the Nyquist frequency
  - a moving sound source is panned linearly between two speakers
14. The range of frequencies that humans can hear is approximately:
- 0 to 22,050 Hz
  - 100 to 1,000 Hz
  - 20 to 20,000 Hz
  - 0 to 32,767 Hz
15. A sound file format that can provide fully CD-quality audio is:
- MP3
  - AAC
  - AIFF
  - GSM EFR
16. If an audio signal is shown in the computer to have a peak amplitude of 0.125, the number of decibels it can be amplified in the program without clipping is:
- 6 dB
  - 8 dB
  - 18 dB
  - 48 dB