DAT330 – Principles of Digital Audio
Cogswell Polytechnical College
Spring 2009

Assignment #1
Due 02/11/09

1. Considering the Nyquist theorem, what is the minimum sample rate necessary to guarantee the following signals be completely reconstructed:
A. Signal with components up to 20 kHz
B. Signal with components up to 5 kHz
C. Signal with components up to 24 kHz

2. What is the highest frequency that may be accurately represented by sampling at the following common sample rates:
A. 8 kHz
B. 32 kHz
C. 44.1 kHz
D. 48 kHz
E. 96 kHz
F. 192 kHz

3. What is the maximum dynamic range that can be encoded by words of the following number of bits? Dynamic range is defined as $20\log_{10}(2^n)$, where n is the number of bits.
A. 8 bits
B. 12 bits
C. 16 bits
D. 20 bits
E. 24 bits
F. 64 bits

4. What is the minimum number of bits necessary to fully encode the following dynamic ranges? (Hint: you have to take a base-2 logarithm).
A. 48 dB
B. 60 dB
C. 72 dB
D. 90 dB
E. 120 dB

5. How does a self-clocked digital audio interchange differ from an externally clocked one?

6. What is jitter and how is it involved in digital data transfers?