

CS 111 Quiz #1: Instructions

- 10 multiple-choice questions
- Each question displayed for **one minute only**
- Record your responses using your clickers/Reef app
- Record your responses **when polling starts** for that question
- If you miss a question, you will not receive any credit for it

Question #1

What is the *minimum sampling frequency* required to accurately reconstruct a signal whose frequencies are in the range of 5-10 kHz?

- A. 2.5 kHz
- B. 5 kHz
- C. 10 kHz
- D. 20 kHz**
- E. 25 kHz

Question #2

An audio signal has a bandwidth of 150Hz. Which of the following will be an appropriate number of *samples per second* to adequately sample the signal?

- A. 50
- B. 150
- C. 250
- D. 350**
- E. None of the above

Question #3

A range of values from 0-63 is mapped uniformly to 3 bits. What is the maximum quantization error?

- A. 2
- B. 4**
- C. 8
- D. 16

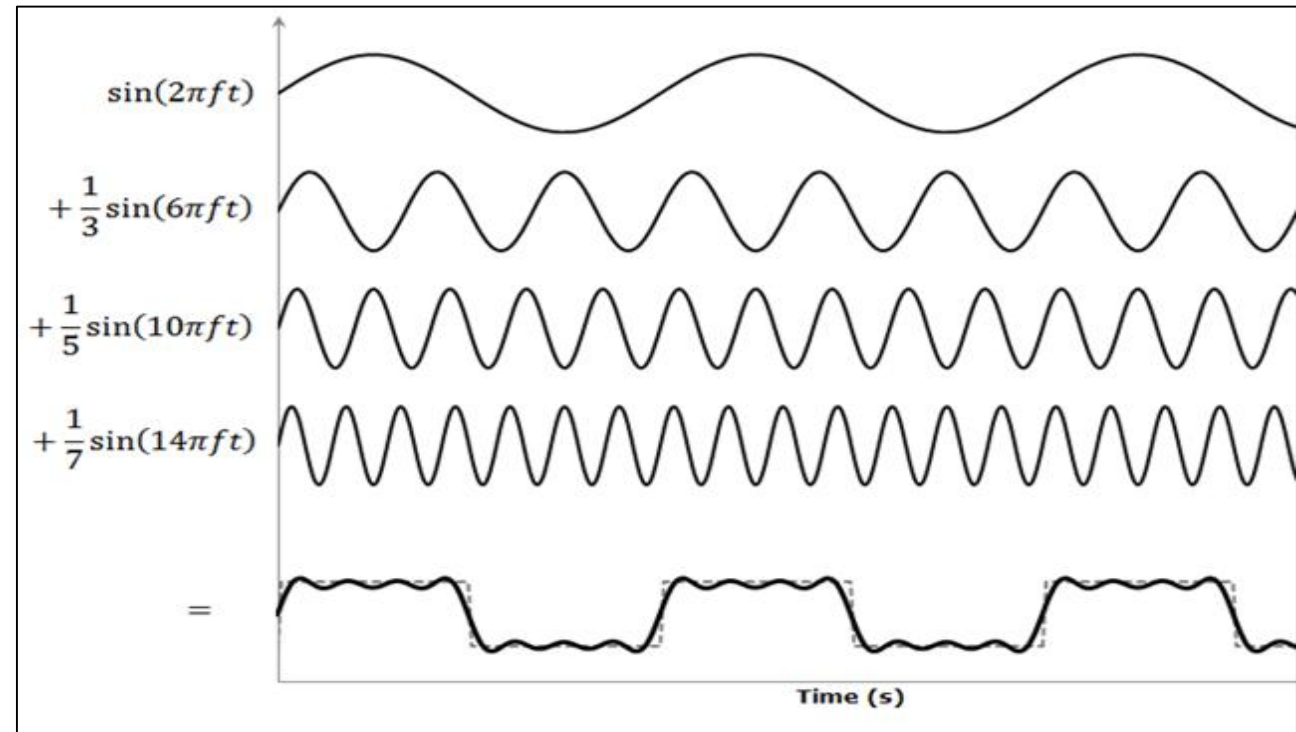
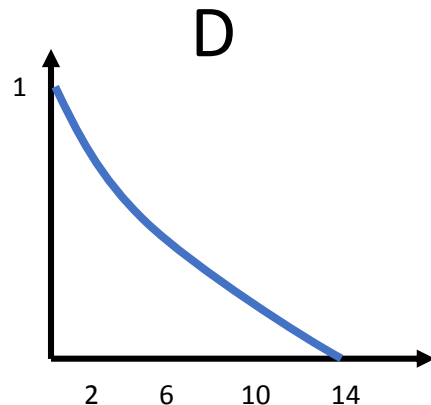
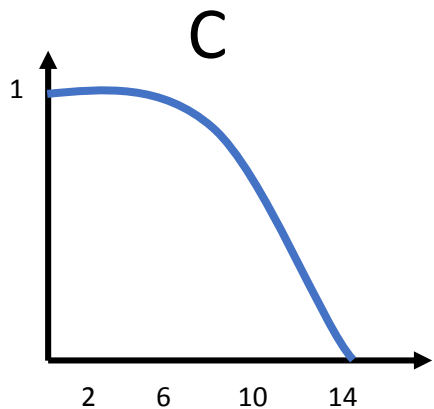
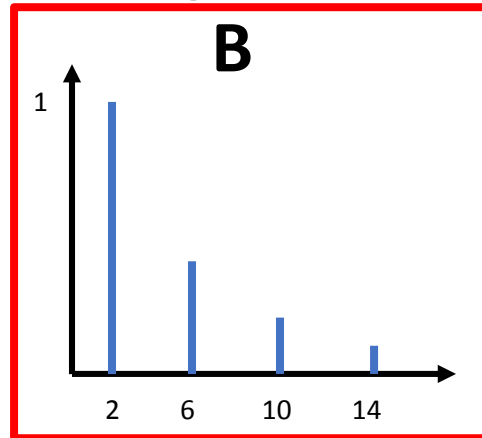
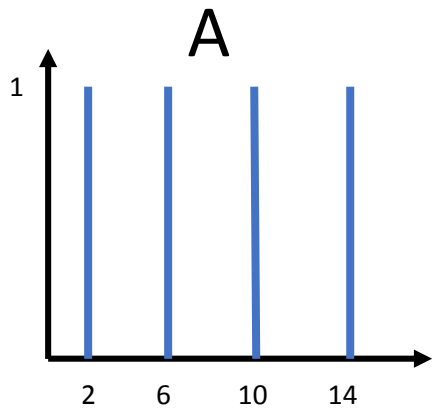
Question #4

Consider two 1D filters: $[\frac{1}{3}, \frac{1}{3}, \frac{1}{3}]$ and $[\frac{1}{4}, \frac{1}{2}, \frac{1}{4}]$. These two filters differ in their

- A. size
- B. shape**
- C. both shape and size
- D. impulse response

Question #5

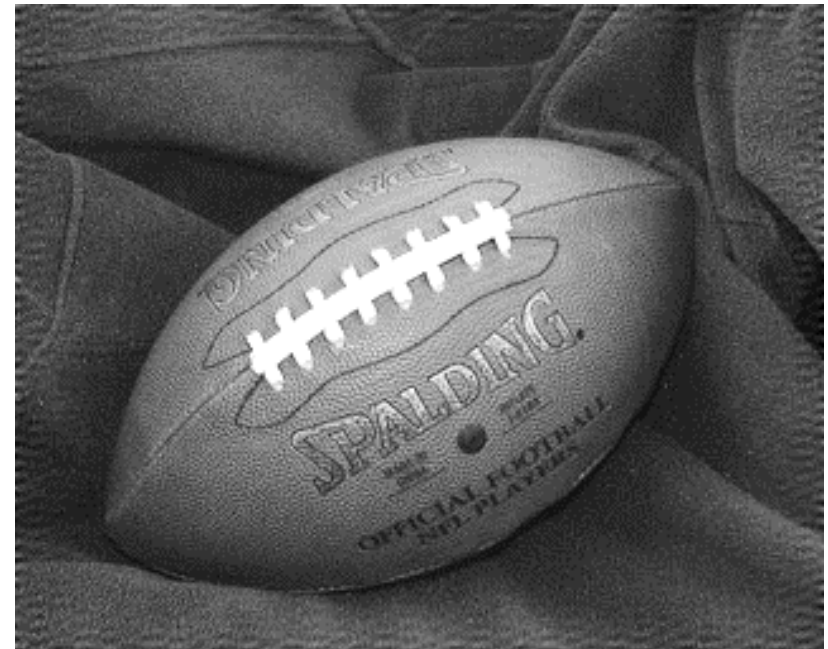
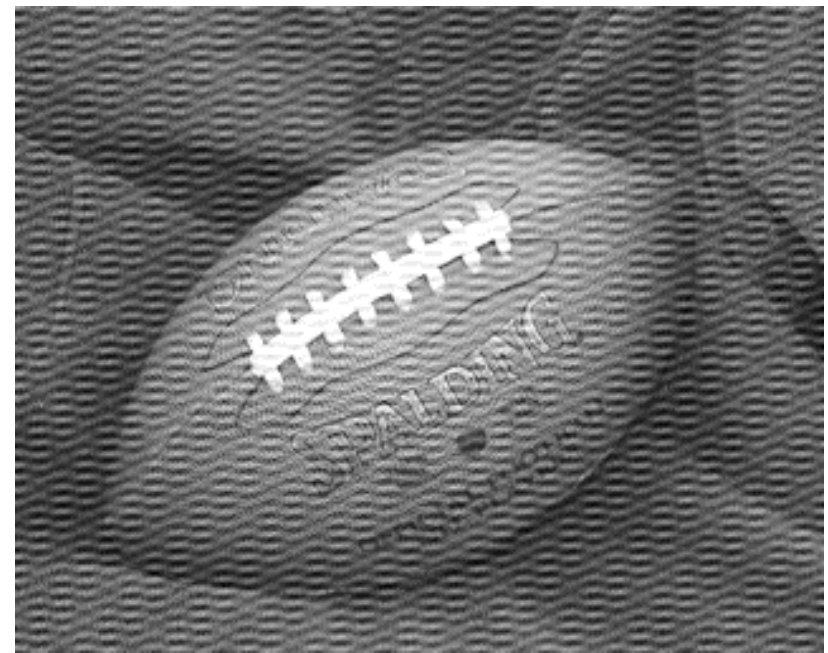
What is the approximate frequency representation of the signal on the right?



Question #6

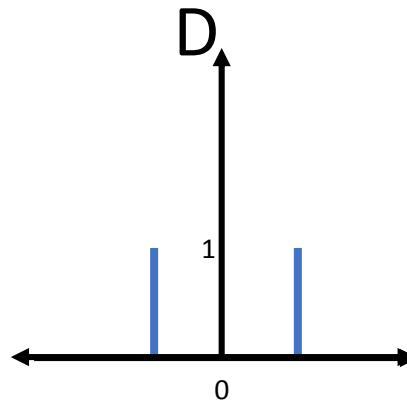
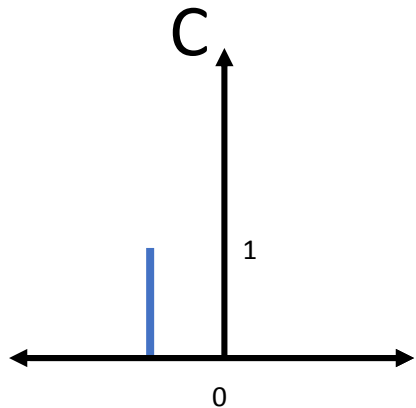
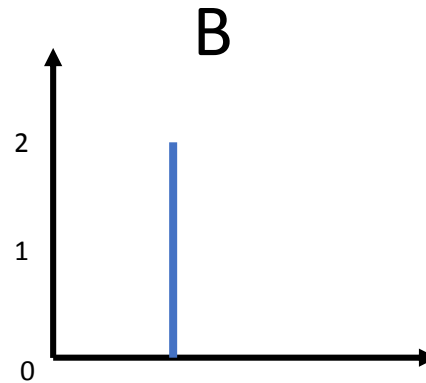
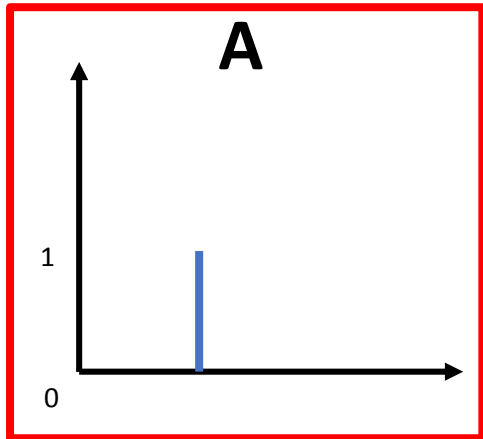
Which of the following filters has been used to process the top image to create the bottom one?

- A. Band-pass filter
- B. High-pass filter
- C. Low-pass filter
- D. Median filter
- E. **Notch filter**



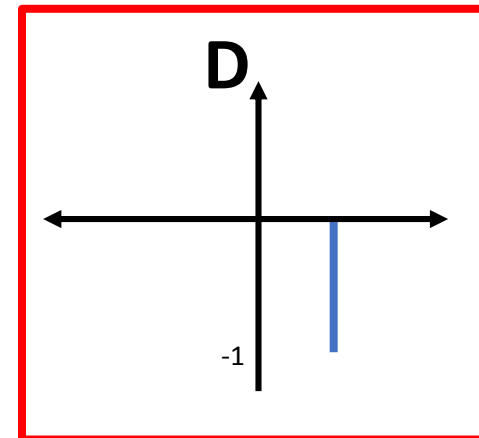
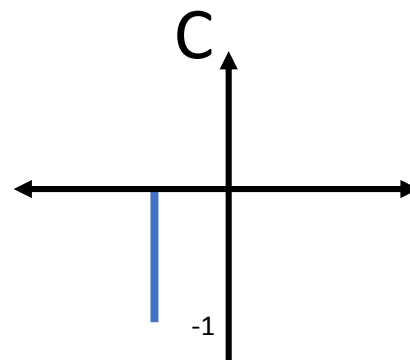
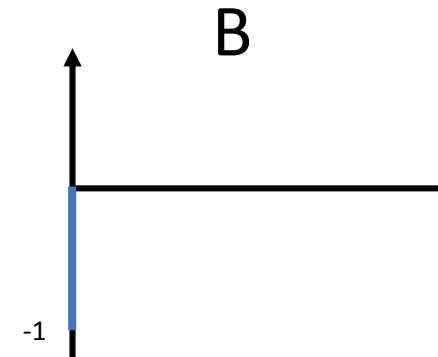
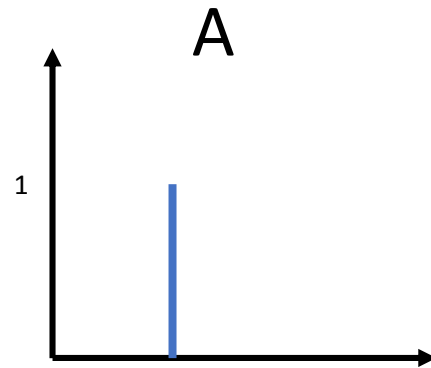
Question #7

What is the impulse response of a system that causes signal delay?



Question #8

Which of the following impulse responses will **invert** and **delay** the input signal ?



Question #9

When sampling, if the number of bits is reduced, the quantization error:

- A. **Increases**
- B. Decreases
- C. Stays the same

Question #10

Aliasing is caused by

- A. Insufficient bits
- B. Insufficient sampling**
- C. Noise in the image
- D. Changing the image representation