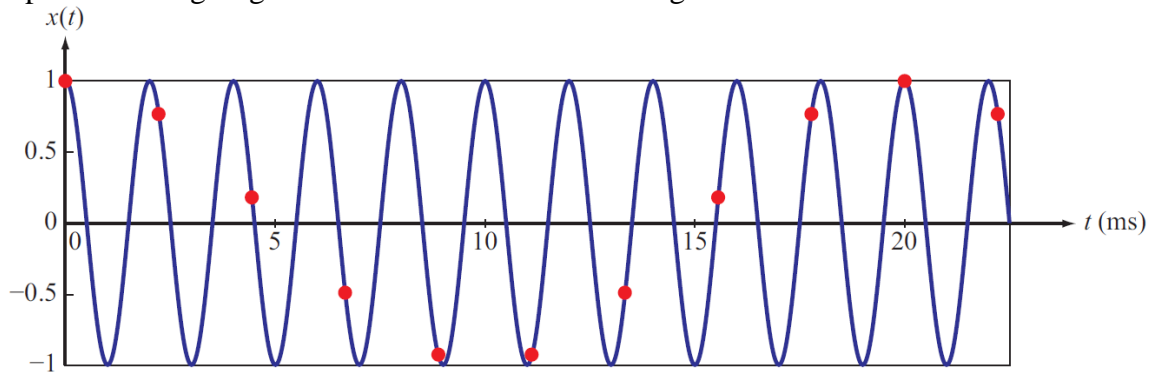
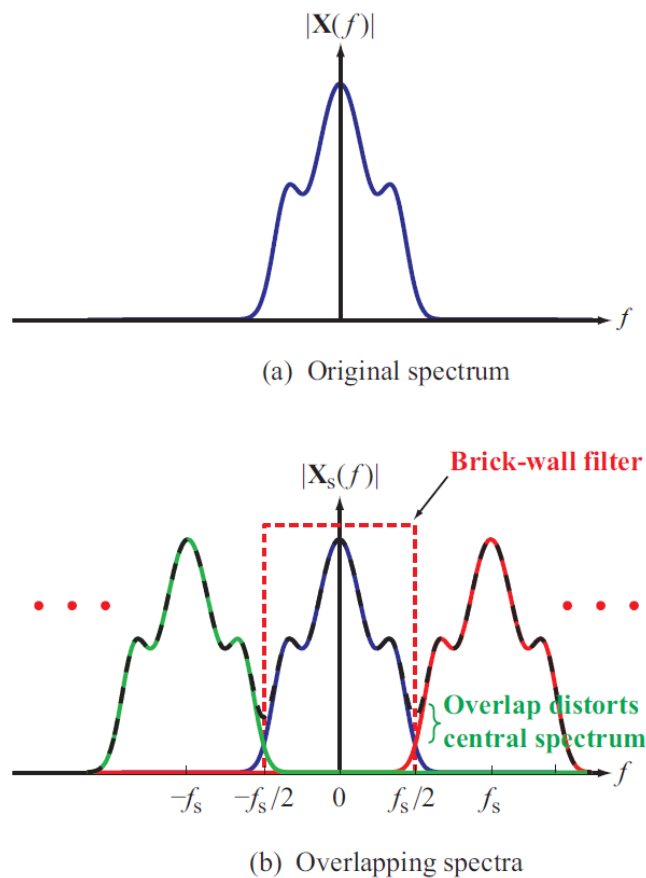


**Concept Question 6-20:** What is signal aliasing? What causes it? How can it be avoided?

If a signal is sampled at a rate less than the Nyquist rate, the copies of its spectrum induced by sampling will overlap. Low frequencies from the first copy can masquerade as high frequencies in the original, hence the term “aliasing.” It can be avoided by ensuring that the sampling rate exceeds the Nyquist rate, which is double the highest frequency in the signal. Example 6-19 is an example of aliasing. Fig. 6-78 is another view of aliasing.



**Figure 6-78:** The 500 Hz sinusoid, sampled at  $f_s = 450$  Hz, appears to the eye like a 50 Hz signal.



**Figure 6-79:** Spectrum of sampled signal consists of overlapping spectra.