Signal Processing First
Chapter 3 questions

1. p. 37 What is the frequency representation of a signal?
2. What is the DC component?
3. p. 38 Why is the frequency domain representation useful?
4. Where do negative frequencies come from?
5. p. 40 A product of two real sinusoidal s, e.g. \( \sin(\omega_1 t) \cos(\omega_2 t) \), is equivalent to the sum of two sinusoidal s of what frequencies? What are these frequencies called?
6. What is the envelope of a signal?
7. p. 42 For amplitude modulation, what is the carrier signal?
8. What is the requirement for proper AM modulation? Give examples of proper and improper (illegal) modulation.
9. p. 43 For periodic signals, define: period, fundamental period, fundamental frequency, harmonic frequencies.
10. Be able to find the fundamental frequency among a set of harmonically related frequencies. Also give an example of a non-periodic signal.
11. p. 47-48,50 What are the analysis and synthesis equations for the Fourier series?
12. p. 49 What is the orthogonality property? Give an example of two orthogonal sinusoids.
13. p. 54-55 In synthesizing a discontinuous periodic signal using a finite number of harmonics, what characteristic of the waveform is different from synthesizing a continuous signal?
14. p. 56-57 In synthesis, what is the rule on the convergence of the synthesized waveform?
15. p. 58 What is the spectrogram of a signal?
16. p. 59 What is an octave?
17. p. 61 What is instantaneous frequency?
18. What is frequency modulation?