On Reading the Lim´s Chapter 1*

Answer with your words, based in the signal/image theory recommended and in the complementary material you have found (pp. 1-2 **):

1- What is to be *analog or continuous* and *digital or discrete* in ***space/time*** for signals or sequences?
2- What is to be *analog or continuous* and *digital or discrete* on ***amplitude*** for signals or sequences?
3- Why ***space and time*** can be taken as the *same parameter?*
4- Why ***signals and sequences***, in this approach, can be considered ***synonymous?***

Signal group:

5- Show using figures and words the importance of the signal named:
   a) Impulse, Delta or *unit sample sequence*; (p. 3 **)
   b) Step (*degrau* in Portuguese) ; (p. 5
   c) Separable sequences; (pp. 6-7)
   d) Periodic (p. 8).

6) Explain what means Linearity and Shift Invariance (invariancia à translação) (p. 12)
7) Explain how what computations are done in the convolution operation (figure 1.13 p. 15)
8) Explain how the convolution is done in case of separable operator (figure 1.16 p. 19)
9) What is a causal system? (p. 20).
10) What is a quadrant support system? (p. 20).

Image group:

5- What visually happen in a computer image when the quantization of Amplitude is reduced? (pp. 9-10**)
6- What visually happen in a computer image when the number of pixels in the sampling ***space is reduced*** and it is showed ***in the same physical area?*** **(pp. 9, 11)**

7- Use an image transformed to the 5 & 6 various conditions to illustrate the above questions. (pp. 10-11)

8- Using an image do the convolution of it using the low pass filter of figure 1.19 as done in figure 1.20 (pp. 26-27)

9- Using an image do the convolution of it using the high pass filter of figure 1.21 as done in figure 1.22 (pp. 26-27)

10- Using examples show how is typically the Fourier spectrum (or the energy distribution) of them. (pp. 39-41, figure 1.33)

Biomedical Image group:

5) What is the main application of the Projection Slice theorem (p. 42);

6) Why it is also named Radon Transforms? (p. 43)

7) Explain using word as it works in reconstruction of 2D signals. (Figure 1.36-37)

8) Are there others reconstruction methods? (p. 44)

9) Find movies of Radon's transform on reconstruction.

* - Text book for graduate course in Dep. of Electrical Eng. and Computer Science at MIT: 2D: Jae S. Lim, Signal and Image Processing, Prentice Hall, New Jersey.
** - Here the "number of the pages" of the bottom left or right in the PDF.