Exercise Number: 6.2.7

In this problem, we are asked to list specific memory addresses that are 13 bits long, so naturally if we represent memory addresses in hex there will be 4 hexadecimal digits required, with the last one only varying between 0 and 1–regardless of other constraints imposed by the further specifications of this problem.

There are also 2 block bits and 3 set bits.

A. In our first problem, let x denote an arbitrary bit: 0 or 1. If we know $S = 1$, then the set bits must be 001, and so we have the following general format for any adress satisfying our constraints:

x	x	x	x	x	x	x	x	0	0	1	x	x

Since we partition these into 4 to digits each, starting from the left, and the x's are allowed to vary freely, it follows that of the five hex digits we could possibly have representing this address:

(a) The first will be any binary number the first two bits could possibly be, plus 4, so 4, 5, 6, 7.

(b) Second one must have first bit 0, so it is all even numbers from 0 to 15

(c) Third is allowed to vary freely

(d) Fourth can only be 0 or 1, since it is only one bit.

B. Essentially we have the same structure here, except it's in the format:

x	x	x	x	x	x	x	x	1	1	0	x	x

(a) The first will be any binary number the first two bits could possibly be, plus 8, so 8, 9, 10, 11.

(b) Second one must have first bit 1, so it is all odd numbers from 0 to 15

(c) Third is allowed to vary freely

(d) Fourth can only be 0 or 1, since it is only one bit.

Discussion. Not much to discuss here...just kind of going through the motions.