Problems #4 &# 5

Mapping an area as MAP_SHARED causes change to memory to be carried through to the original file. However, the EOF is still present, thus stat(2) will still only count until the end of file. In problem #4, the size does not change because a byte was added to memory past the end of the file. Even though it is written back to the file, stat(2) will stop at the EOF before that byte. In problem #5, because lseek(2) is used, the EOF is moved to be 16 bytes after byte X. Because of this, the extra byte that is written can still be viewed because the EOF was moved to after byte X.

Problem #6

If a file does not fill a whole page in memory, the remainder of the page is filled with 0s (that is why the byte read in the first reading is a 0). But the second page that was requested with MMAP is not filled until it is needed. Therefore, when you try to read from the second page you get a signal 7 SIGEMT, because the second page is not allocated at all. Signal 7 is Emulation Trap, which means that the kernel came accross an instruction that is not in the GNU library, or the kernel failed to emulate it. Reading from the second page which is unpopulated may be an instruction that cannot be done.