Name:_____

**Problem 5 (15 points)**

The table below shows the partial contents of the MAR and the MDR for seven consecutive memory accesses during execution of a program. We call such a sequence a "memory trace."

**Your job:** Complete all entries in the memory trace, and explain what, if anything, is displayed on the monitor before the program halts.

| Memory Access | MAR | MDR (bit 15 … bit 0) |
|---|---|---|
| 1 | x3000 | 0 0 1 0 0 0 0 0 0 0 1 0 1 1 1 1 |
| 2 | ***x3030*** | ***1 1 1 1 0 0 0 0 0 0 1 0 0 1 0 1*** |
| 3 | ***x3001*** | 0 0 0 0 1 1 1 ***0 0 0 1 0 0 0 0 0*** |
| 4 | x3022 | 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 |
| 5 | ***x3023*** | ***1 1 1 1 0 0 0 0 0 0 1 0 0 1 0 1*** |
| 6 | ***x3023*** | ***1 1 1 1 0 0 0 0 0 0 1 0 0 1 0 1*** |

The original assembly language program contained the line:

LABEL .FILL xF025

In performing its job the Assembler created the symbol table entry:

LABEL x3030

Nothing is printed and the machine halts