

CHAPTER 7 EXERCISE

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QUESTION 1: -

What are there two different registers (MAR and MDR) associated with memory?

Ans: MAR and MDR are two CPU registers. MAR is a register which holds the address of the memory area where information is out away. Information from address at MAR is being put away in MDR. Moreover, MDR contains the genuine information being transferred to and from the capacity. MDR could be a two-way register for example information studied from memory is out away in MDR and brought by the CPU for calculation and comes about of the calculation from CPU are put away MDR some time recently being composed in memory. The reason of these registers is that there's a parcel of distinction between the speeds of CPU and the memory rather than CPU pursuing and composing from memory. This makes a difference CPU in decreasing hold up times.

The MAR holds the address in the memory and the MDR connects to every cell in the memory unit. Little Man Computer uses program counter or MAR to get the memory address and he uses some memory cells as MDR.

QUESTION 2 : -

Suppose that the instruction format for a modified Little Man Computer requires two consecutive locations for each instruction. The high-order digits of the instruction are located in the first mail slot, followed by the low –order digits. The IR is large enough to hold the entire instruction and can be addressed as IR [high] and [IR] low to load it. You may assume that the op code part of the instruction uses IR [high] and that the address is found in IR [low]. Write the fetch-execute cycle for an ADD instruction on this machine.

Ans:

PC -> MAR

MDR -> IR[high]

PC + 1 -> PC

PC -> MAR

MDR -> IR[low]

IR[low] -> MAR

MDR -> A

PC + 1 -> PC

References:

Englander, Irv. *The Architecture of Computer Hardware and Systems Software: an Information Technology Approach*. John Wiley & Sons, 2017.

https://en.wikipedia.org/wiki/Memory_address_register.

https://en.wikipedia.org/wiki/Memory_buffer_register.