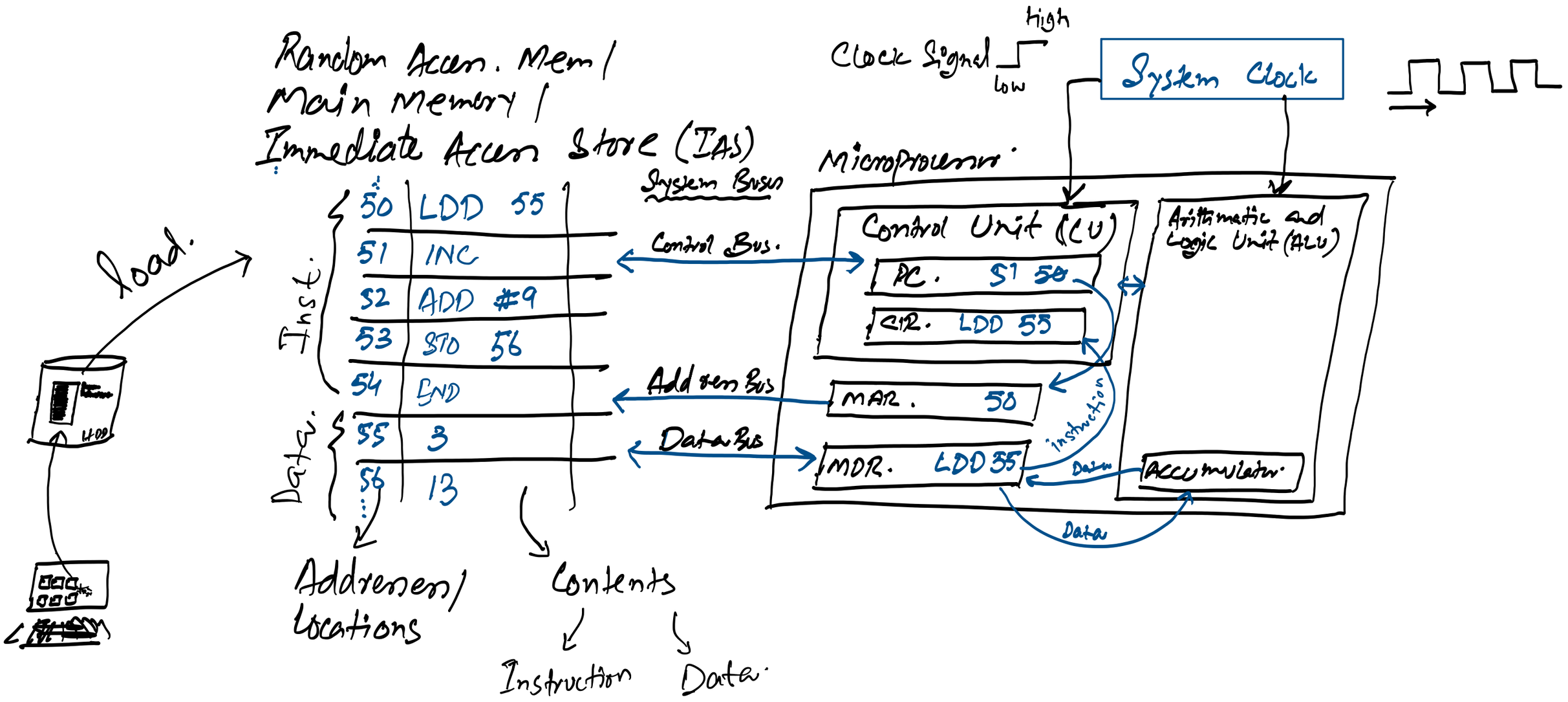
Processor Fundamentals

Saturday, 6 November 2021 3:48 PM



Registers: These are smallest and fastest memories inside a microprocessor with a purpose. Those who has a fixed purpose are called "special purpose" and those who has generalised non-specific purpose are called "general purpose" registers.

Special Purpose registers:

Program Counter (PC): It holds the address of next instruction.

Mem. Add. Register (MAR): It holds the add. of current inst.

Mem. Data. Register (MDR): It holds the inst. whose add. is saved in MAR.

Curr. Inst. Register (CIR): It decodes (understands) and executes curr. inst.

General Purpose Registers:

Accumulator: It is a general purpose register that holds the datas produced during the execution of program and final data.

Fetch Decode & Execute (FDEC) cycle: 1→5 (Fetch), 6→7 (Decode & execute)

1. PC holds the address of next inst.
2. Add. from PC goes to MAR and becomes curr. inst. add.
3. PC increments itself by 1.
4. MDR receives the instruction whose add. was mentioned in MAR.
5. From MDR current instruction goes to CIR.
6. If the current inst. has an address part then add. part goes to MAR.
7. CIR decodes and executes current instruction.

Register Transfer Notation (RTN):

1. MAR ← [PC]
2. PC ← [PC] + 1
3. MDR ← [[MAR]]
4. CIR ← [MDR]
5. [CIR]

[ ] → The content of.