## Example 2

The machine performs a series of actions known as the machine cycle while carrying out the given instructions. Let's explain it in clearer terms:

1. **Jump to address 200, or JMP 200:**

- The device fetches the instruction to be executed next from memory location 200.
- It takes note of this directive and proceeds to the subsequent action.

**2. MOV R1 R2 (Move R2's contents to R1):**

- The computer receives the instruction located at memory location 201.
- It is aware that data must be transferred from register R2 to register R1.
- It carries out this data transfer.

**3. STO 800 R1 (Remember to save R1's contents in memory location 800):**

- The computer retrieves the instruction located at location 202 in memory.
- It understands that it must store the information from register R1.
- The device transmits and stores this data at memory location 800.

The machine's control unit controls the information flow during these processes. It makes sure that every stage of the machine cycle is completed properly, enabling the processor to carry out the designated tasks. The machine cycle entails retrieving, comprehending, carrying out, and storing instructions.

| Address | Contents | Comments |
|---|---|---|
| **100** | **JMP 200** | Proceed to address 200 |
| **200** | **LDA 1000** | Fill the accumulator with the information from memory location 1000. |
| **201** | **MPY 1001** | multiply the accumulator's contents by what is in memory location 1001 and then put the outcome back in the accumulator. |
| **202** | **STO 1002** | Place the accumulator's contents in memory address 1002 |

| | | |
|---|---|---|
| **1000** | **5** | Information kept at position 1000 in memory |
| **1001** | **10** | Information kept in memory position 1001 |

1. **JMP 200 (Jump to Address 200)**
   The machine is instructed to access memory location 200 in search of the subsequent instruction.

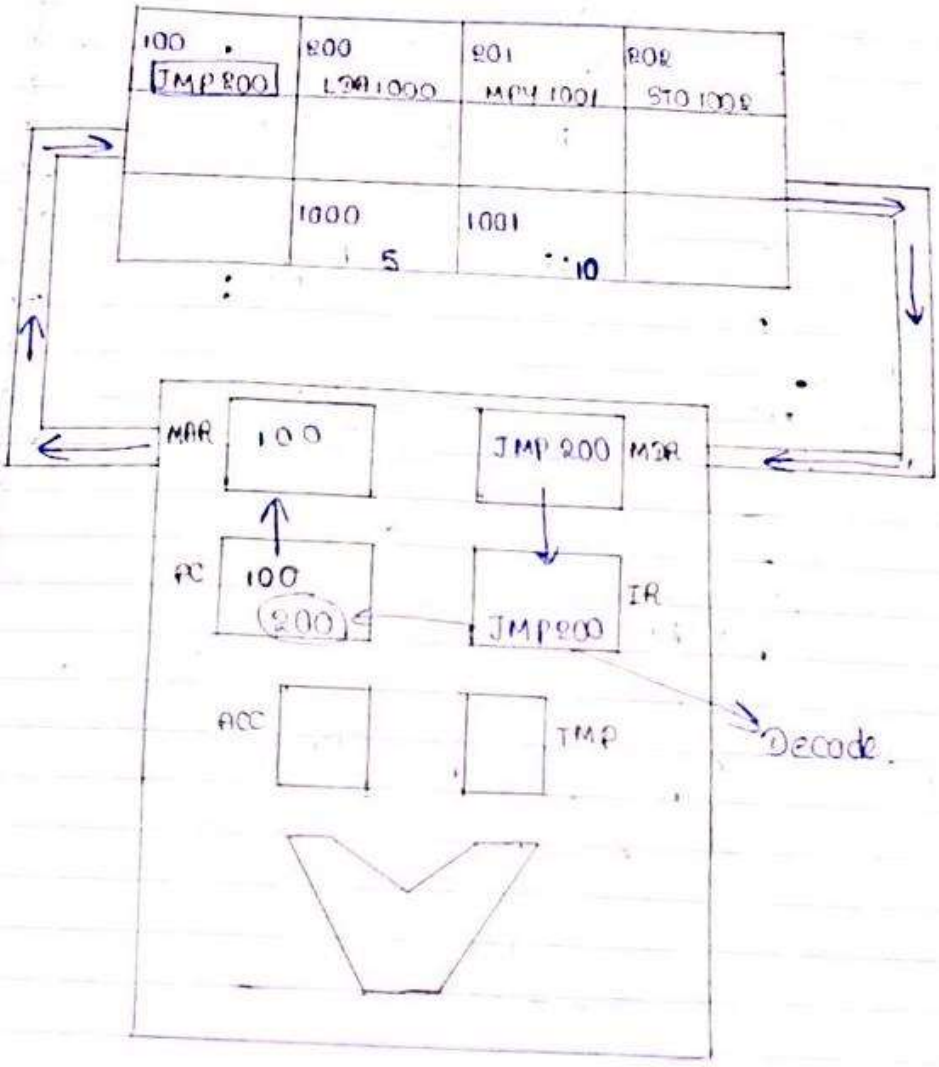
2. **LDA 1000 (load into the accumulator the data from memory location 1000)**
   The computer retrieves the value located at memory address 1000 and stores it in an exclusive storage device known as the accumulator.

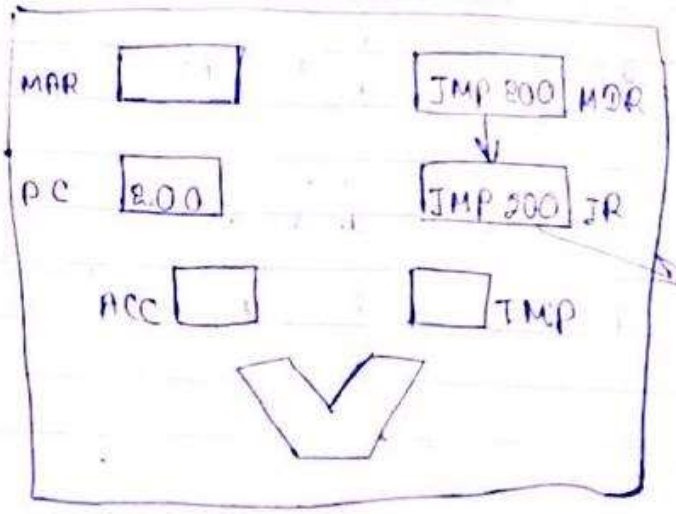
3. **MPY 1001**
   The machine multiplies the value in the accumulator by the value kept in memory location 1001, and then it stores the outcome of the multiplication back in the accumulator.

4. **STO 1002**
   The device reads the value from the accumulator and stores it for later use in memory address 1002.
   The numbers 5 and 10 are located at locations 1000 and 1001, respectively, in the memory.

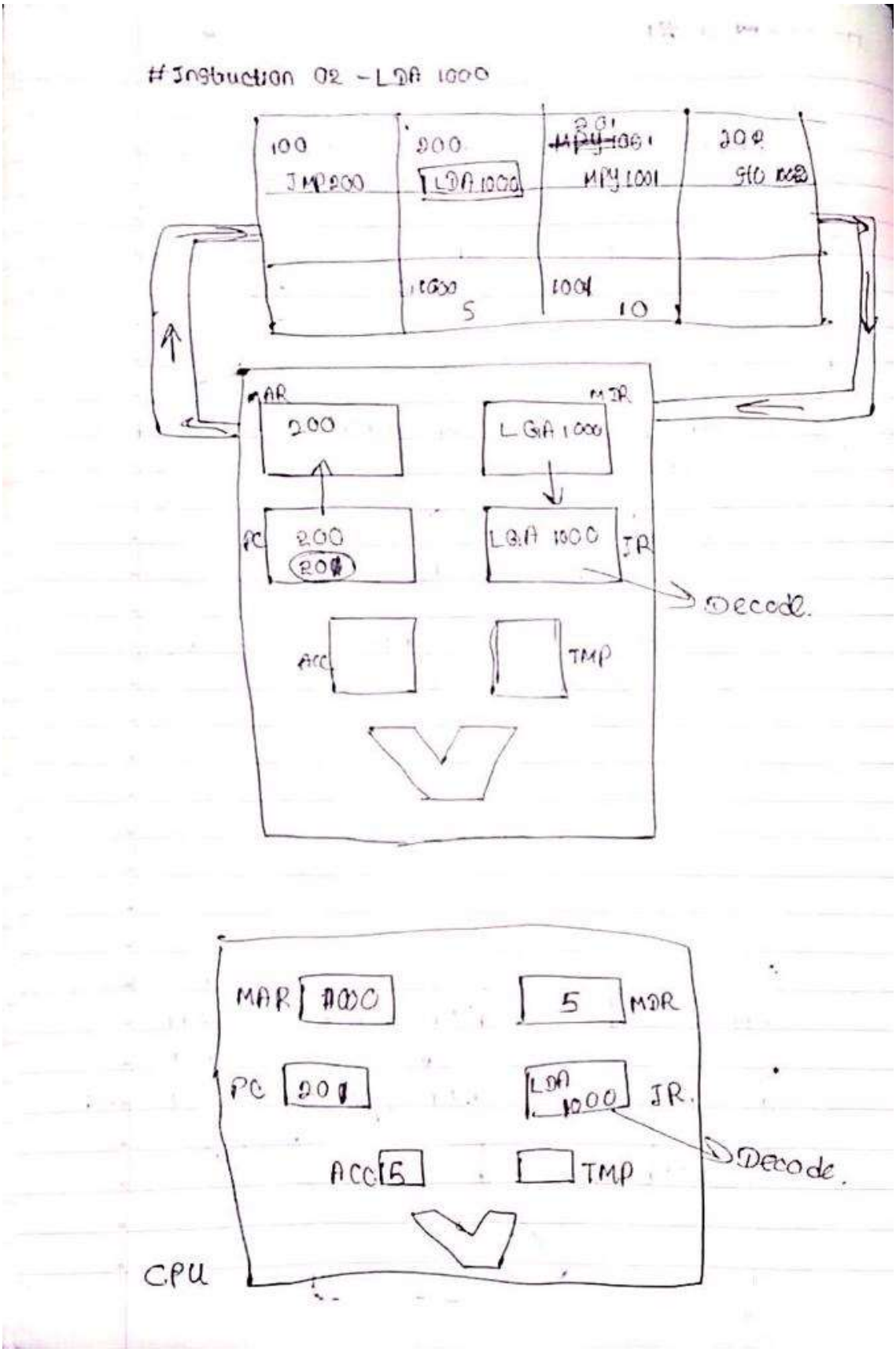
   Consequently, the instructions simply ask the computer to navigate to address 200, read the number 5 from memory into the accumulator, multiply it by 10, and then save the resulting value (50) at memory location 1002.

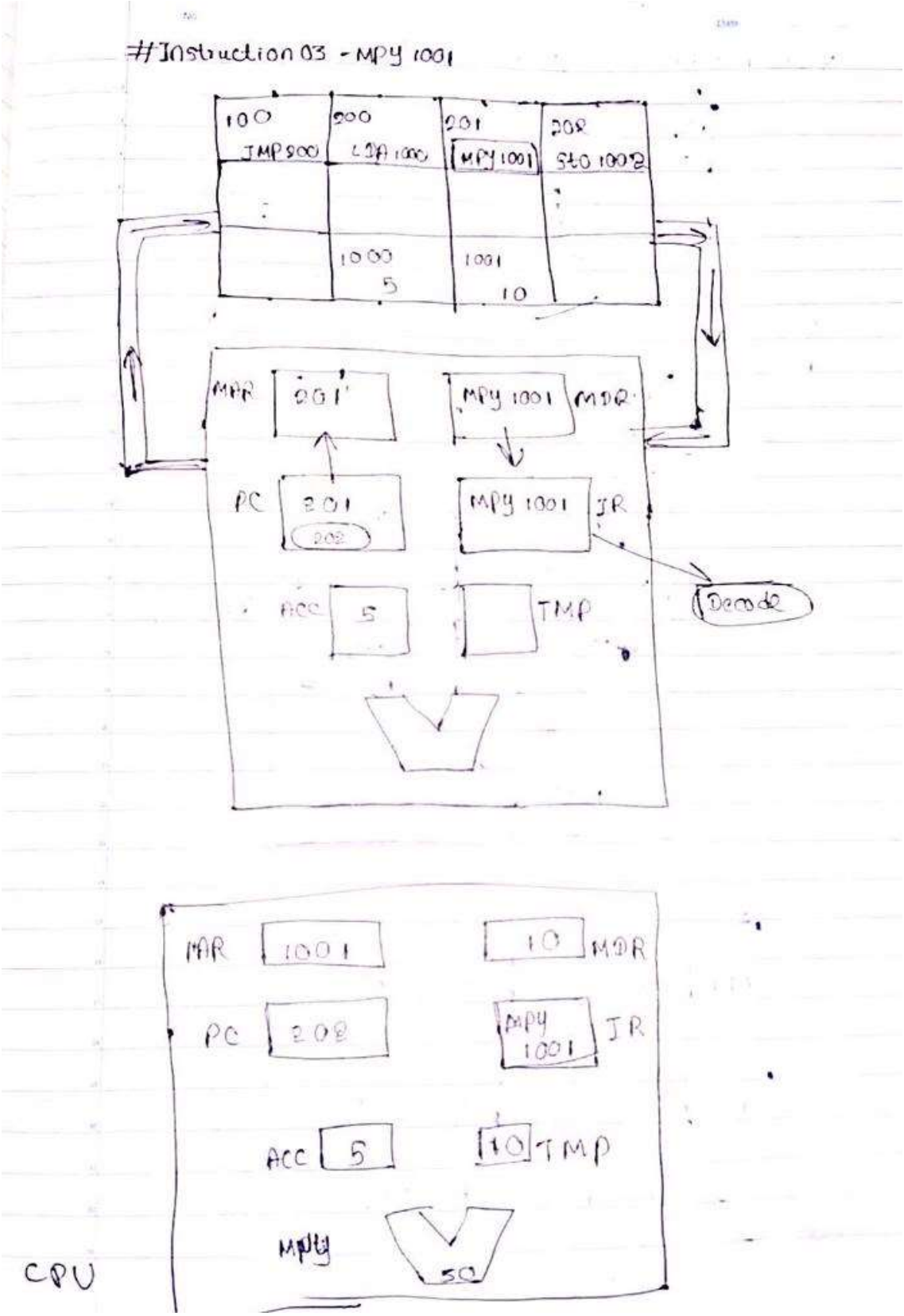
(01) Instruction #1 JMP 200

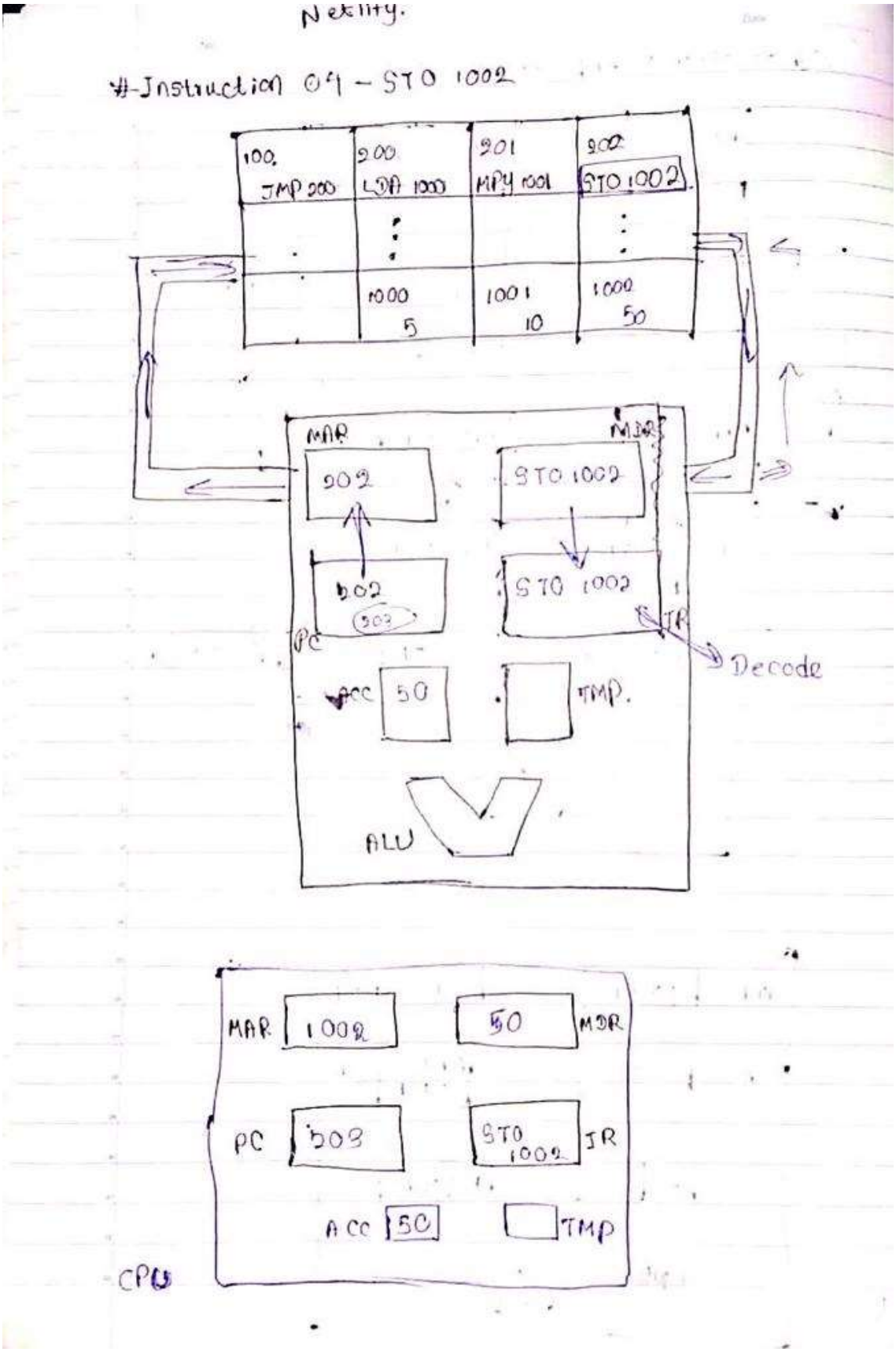



PC = 101
MAR =
MBR =
IR = JMP 20


# Instruction 02 - LDA 1000
100
JMP 200
200
LDA 1000
201
MPY 1001
202
1000
5
1001
10
AR
200
MDR
LDA 1000
PC
200
201
LDA 1000
IR
Decode.
ACC
TMP
MAR
1000
5
MDR
PC
201
LDA 1000
IR.
ACC 5
TMP
Decode.
CPU


#Instruction 03 - MPY 1001
100
JMP 800
800
LDA 1000
201
MPY 1001
208
STO 1002
1000
5
1001
10
MAR
201
MPY 1001
MDR
PC
201
208
MPY 1001
IR
Decode
ACC
5
TMP
MAR
1001
10
MDR
PC
208
MPY
1001
IR
ACC
5
10
TMP
MPY
50
CPU


Netlify.
#-Instruction 04 - STO 1002
100
JMP 200
200
LDA 1000
201
MPY 1001
202
STO 1002
1000
5
1001
10
1000
50
MAR
MDR
202
STO 1002
202
203
STO 1002
PC
IR
Decode
ACC
50
TMP.
ALU
MAR
1002
50
MDR
PC
203
STO 1002
IR
ACC
50
TMP
CPU