

Instruction Cycle

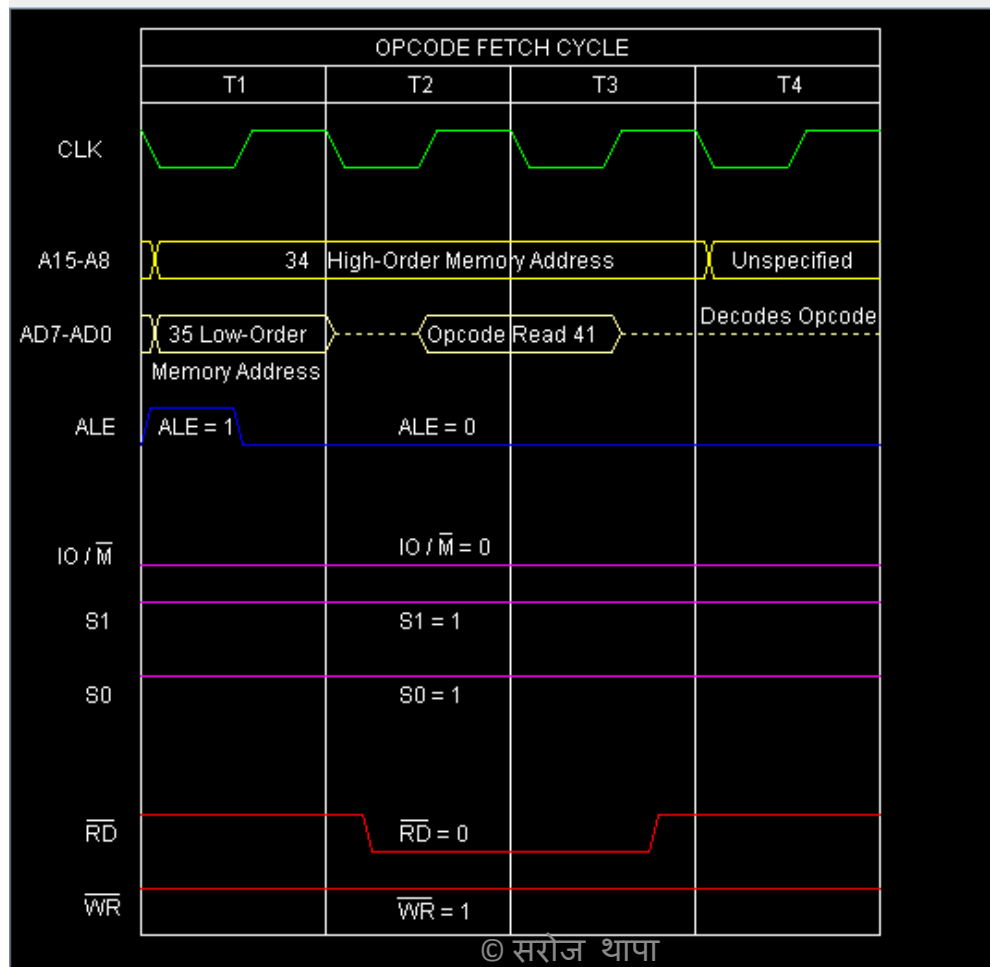
Machine Cycle

Operation of a microprocessor can be classified in to following four groups according to their nature.

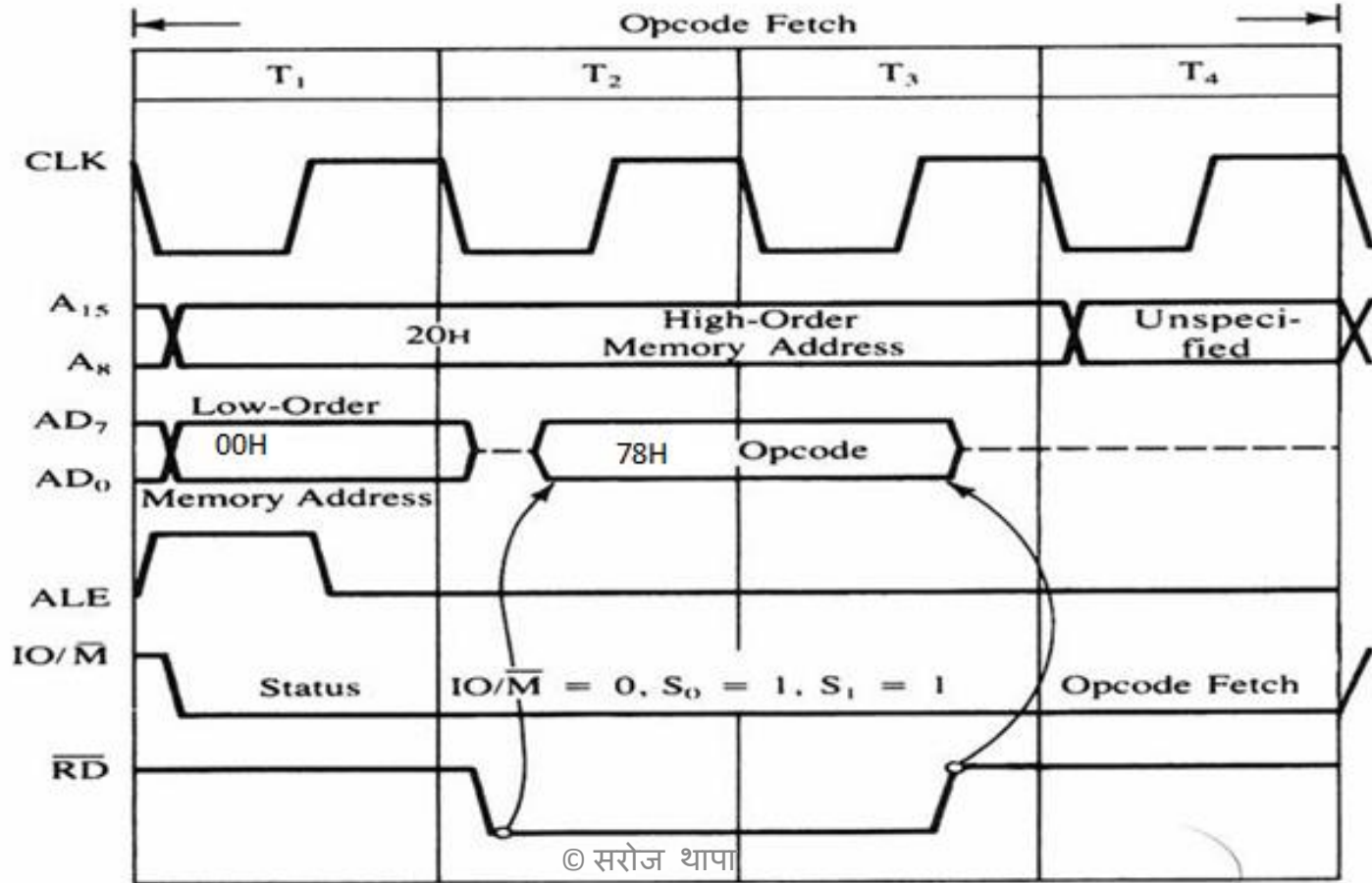
1. Op- Code fetch
2. Memory Read /Write
3. I/O Read/ Write
4. Request acknowledgement

Here Op-Code fetch is an internal operation and other three are external operations.

During three operations, microprocessor generates and receives different signals. These all operations are terms as **machine cycle.**



2000H MOV A,B

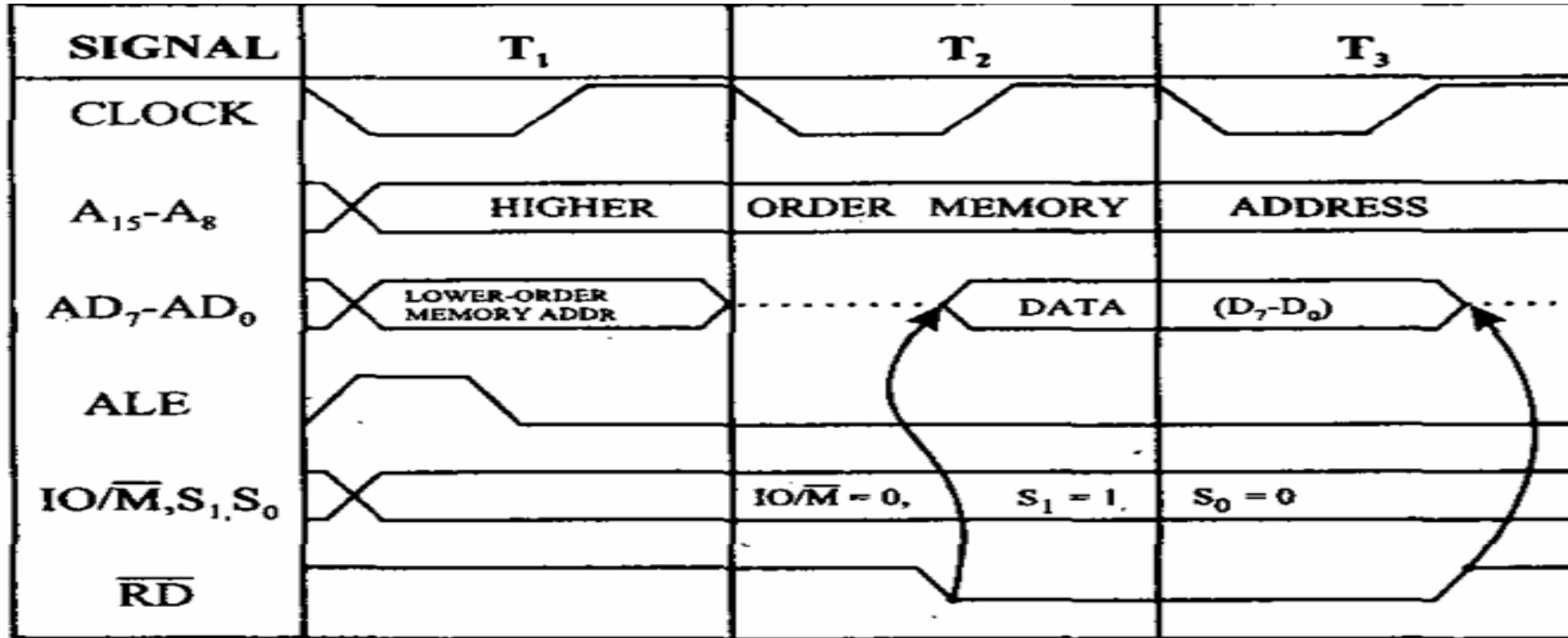


- **In the 1st T-State** i.e. T1 the higher address pins are loaded with the data 20H and the lower address pins with 00H and at the 1st falling edge and all this is done when the ALE signal is enabled. At the same time IO/M signal are enabled and when this signal is low ($IO/M = 0$) it denotes the memory related operations and when this signal is high ($IO/M = 1$) it denotes an I/O operation.
- **In T2 state**, RD signal is activated so that the identified memory location is read from and places the content on the data bus (D0 – D7).

Cont..

- In T3, data on the data bus is put into the instruction register (IR) and also raises the RD signal thereby disabling the memory.
- In T4, the processor takes the decision, on the basis of decoding the IR, whether to enter into T5 and T6 or to enter T1 of the next machine cycle

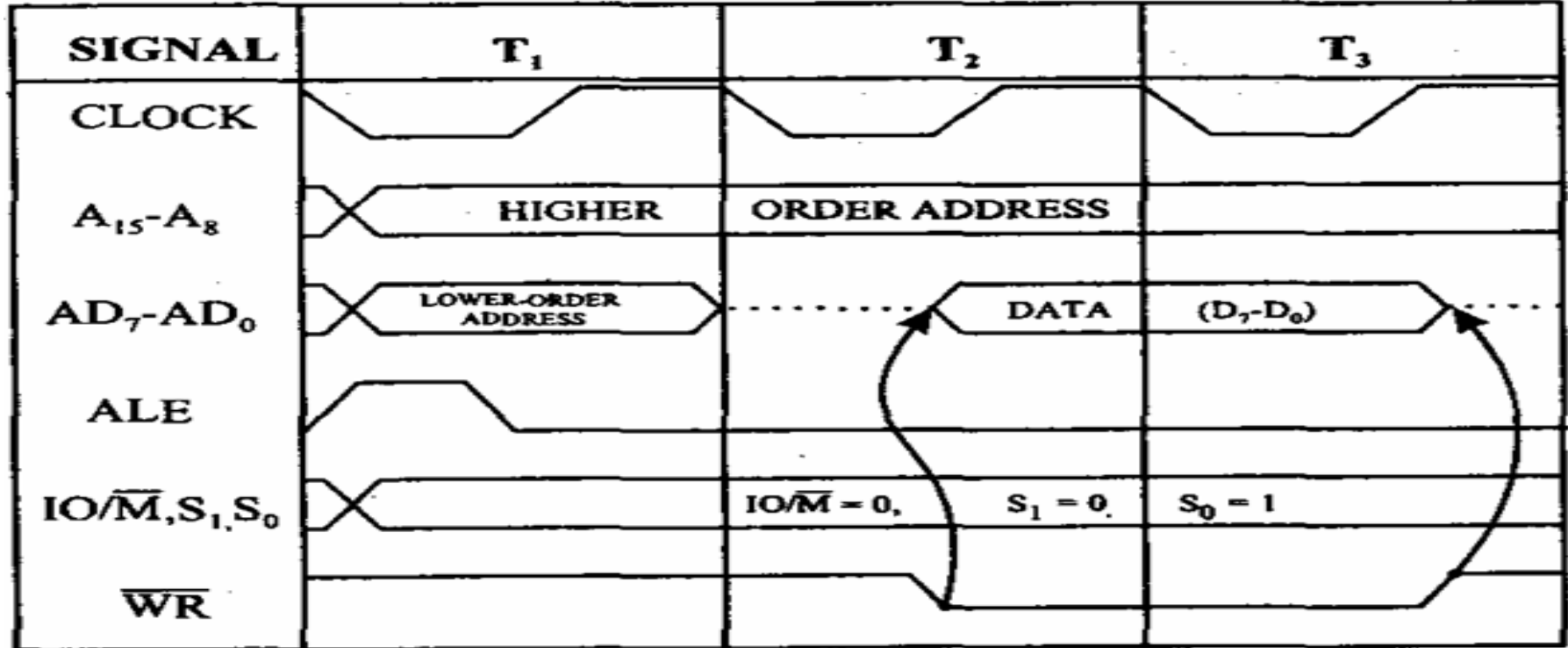
MEMORY READ MACHINE CYCLE OF 8085



MEMORY READ MACHINE CYCLE OF 8085

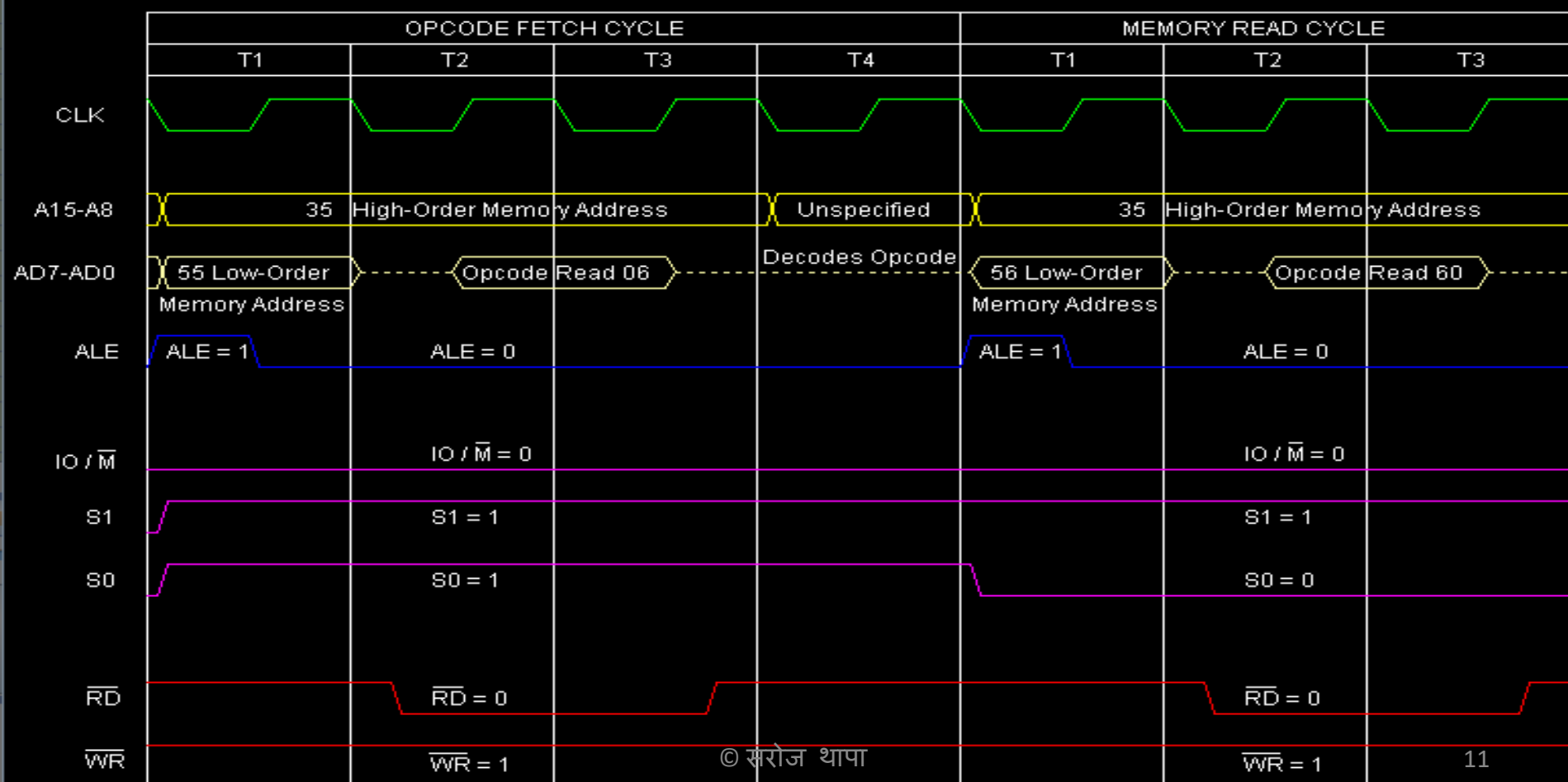
- The memory read machine cycle is executed by the processor to read a data byte from memory.
- The processor takes 3T states to execute this cycle
- The instructions which have more than one byte word size will use the machine cycle after the opcode fetch machine cycle.

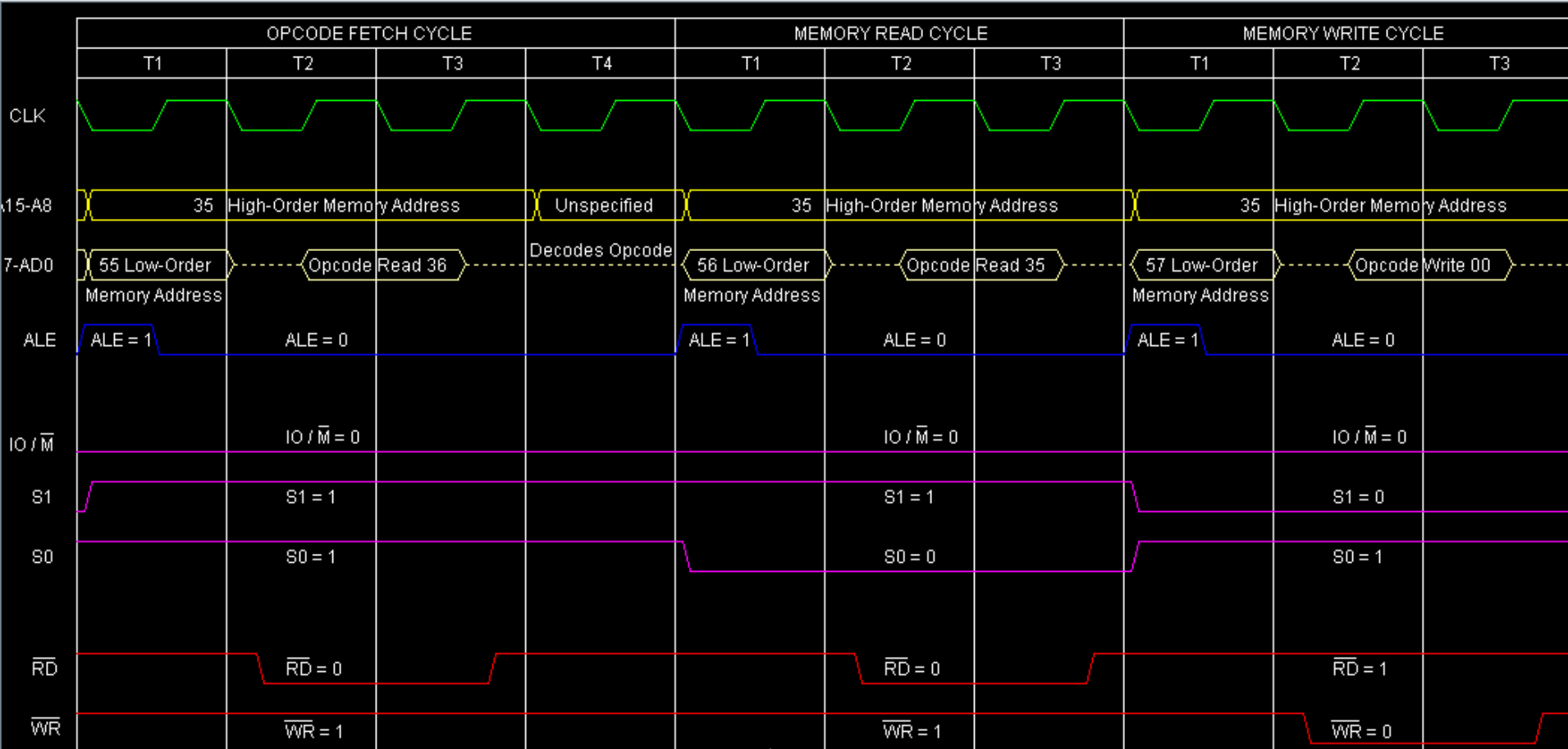
MEMORY WRITE MACHINE CYCLE OF 8085



MEMORY WRITE MACHINE CYCLE OF 8085

- The memory write machine cycle is executed by the processor to write a data byte in a memory location.
- The processor takes, 3T states to execute this machine cycle

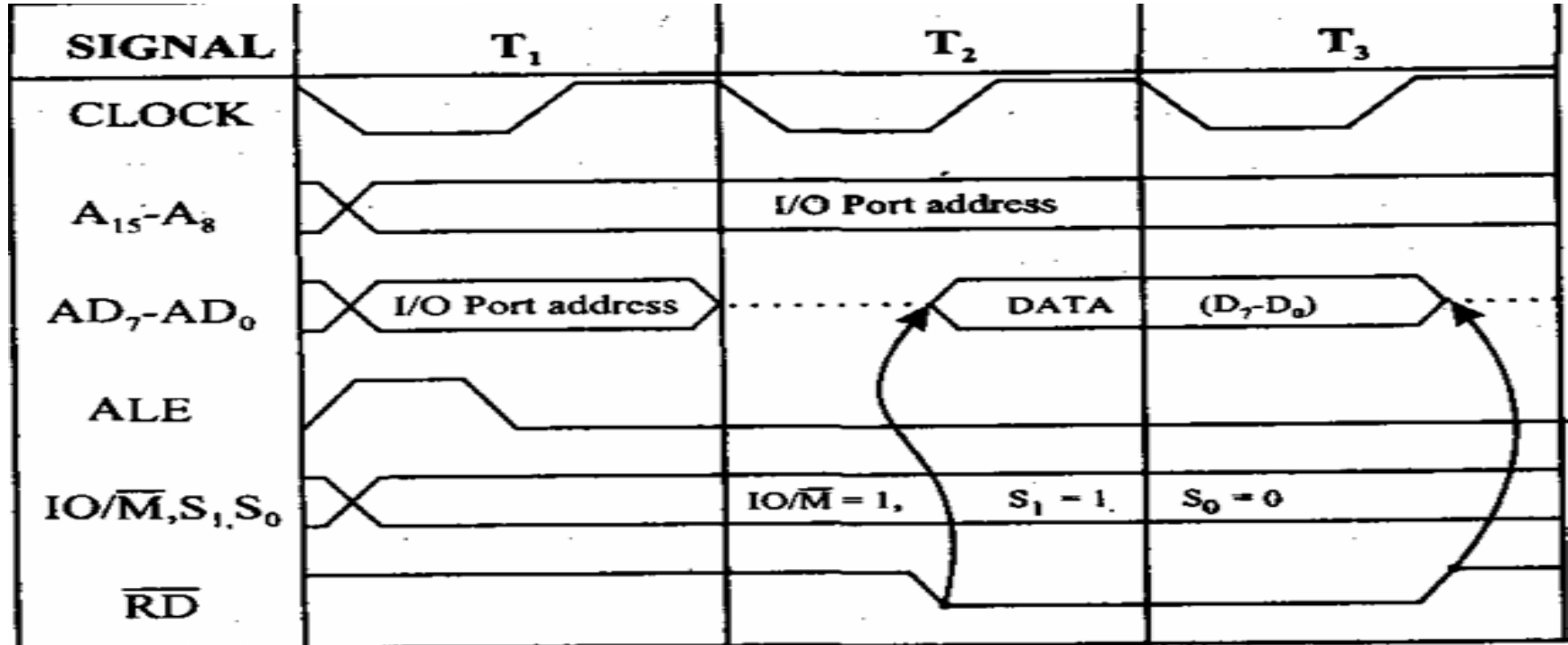




I/O READ CYCLE OF 8085

- The I/O Read cycle is executed by the processor to read a data byte from I/O port or from the peripheral.
- The processor takes 3T states to execute this machine cycle.
- The IN instruction uses this machine cycle during the execution.

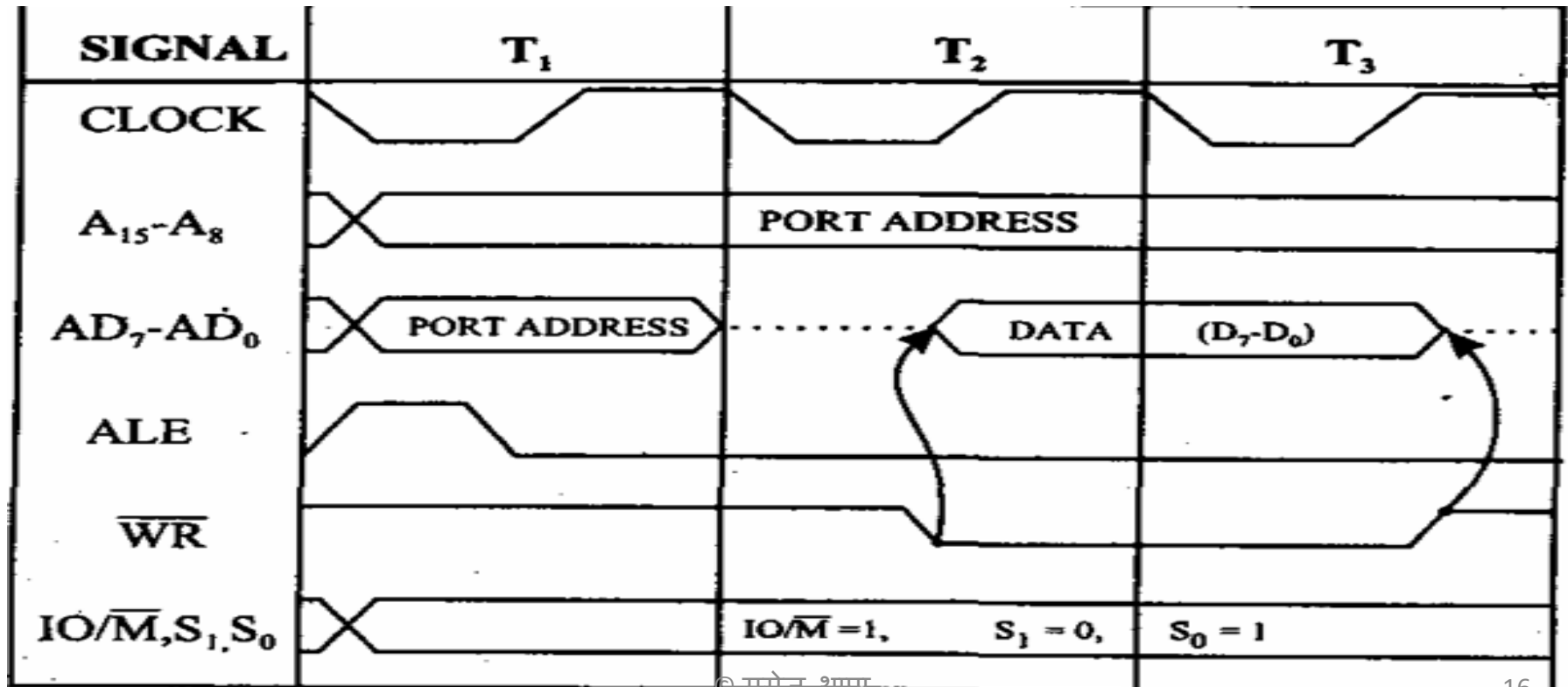
I/O READ CYCLE OF 8085



I/O WRITE CYCLE OF 8085

- The I/O write machine cycle is executed by the processor to write a data byte in the I/O port or to a peripheral, which is I/O, mapped in the system.
- The processor takes, 3T states to execute this machine cycle.

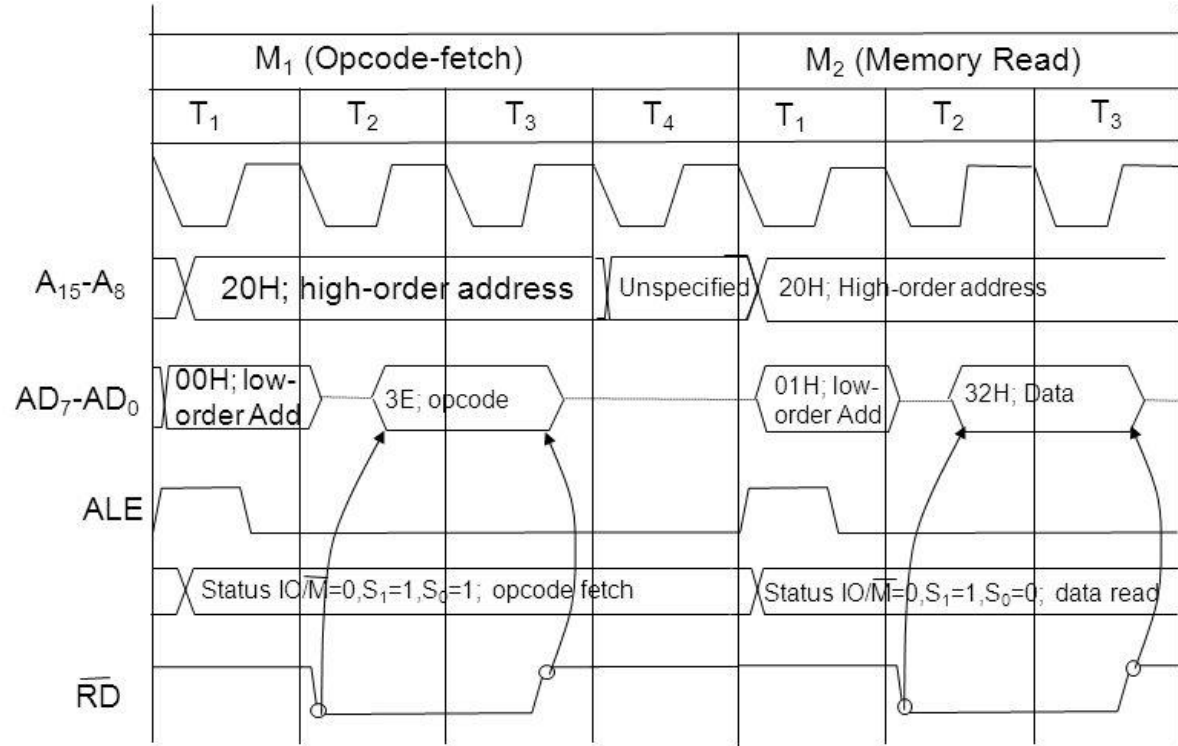
I/O WRITE CYCLE OF 8085



MVI A,32H Instruction

2000H 3EH ;MVI A, 32H

2001H 32H



4FFF H : STA 526AH.

