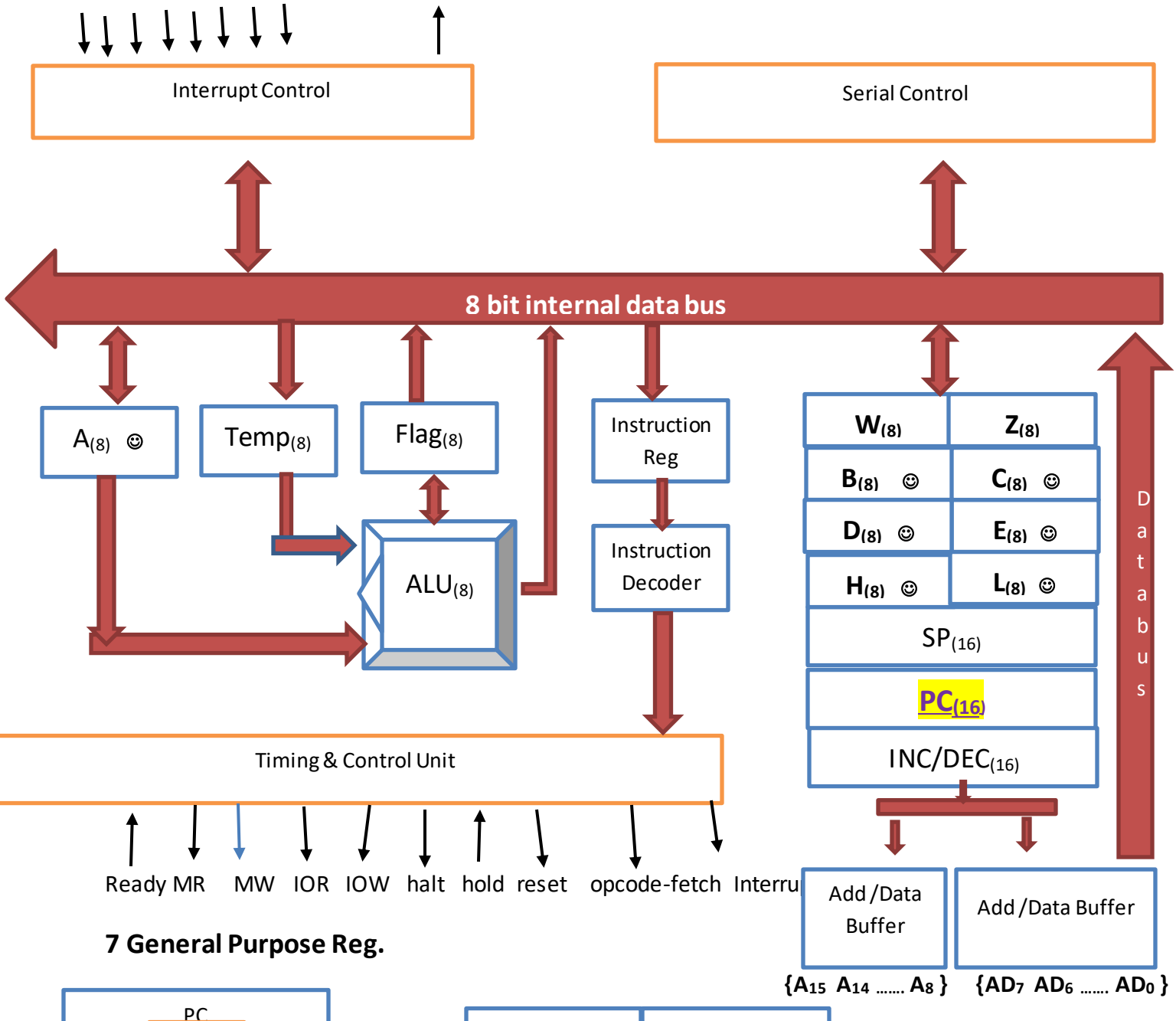
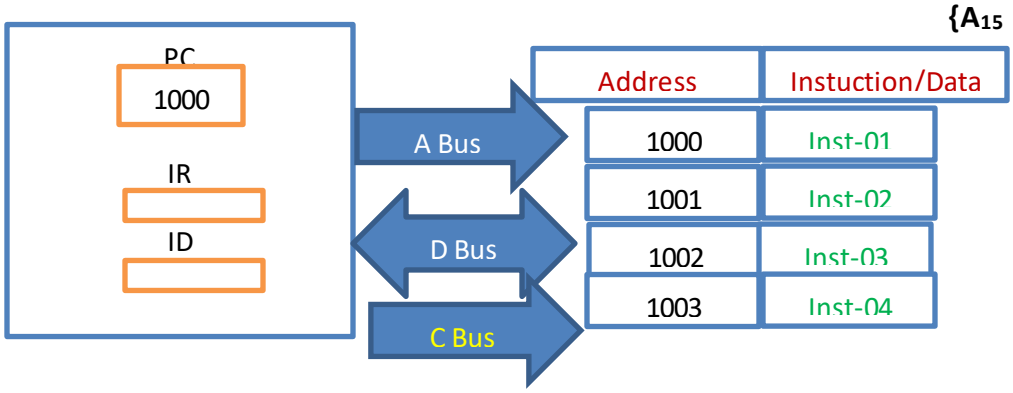
Diagram of 8085 Microprocessor Architecture



7 General Purpose Reg.



Timing and control operation.

Timing and control operations are performed by timing and control unit. These operations synchronize the process of communication between µP and peripheral devices by generating the control signals necessary for communication for e.g. RD and WR signals which indicate the availability of data on the data bus. Whenever µP has to execute any instruction, the instruction is first received by the instruction register (8-bit) through A/D (address/data) bus. The instruction is then passed on to the instruction decoder where it is split, decoded and then passed to the control unit to generate necessary control signals for its execution. Besides doing this timing and control unit also checks whether any internal or external interrupt has occurred. If there is any kind of interrupt request this unit stops the execution of normal sequence of instructions to respond to it (interrupt) by generating the required control signals.

To execute any instruction µP has to pursue the following steps:

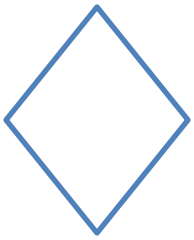
1) Identify the memory location from where the instruction is to be fetched
2) Decode the instruction using instruction decoder
3) Perform the function specified by the decoded instruction

All these operations are performed within a given time interval, which is provided by the clock of the system. With reference to the above-mentioned operations, certain terms can be defined. The definitions are as follows

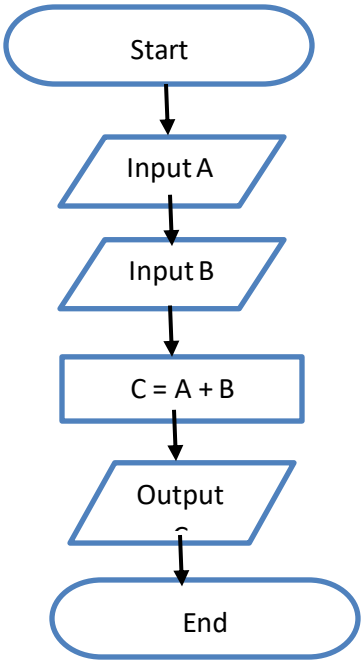
1) **Instruction cycle:** Time required for completing the execution of an instruction is known as instruction cycle. The 8085 instruction cycle consists of one to six machines cycles or operations.
2) **Machine cycle:** It is the time required for completing a single operation. This operation can be accessing memory for read/write operation or accessing I/O device. There can be 3 to 6 clock periods or T-states in a machine cycle.
3) **T-states or clock cycles/periods (CLK):** T-state is equivalent to one clock period It is the time in which only a subdivision of the operation can be performed. The total number of T-states determines the size of the machine cycle required to perform an operation.

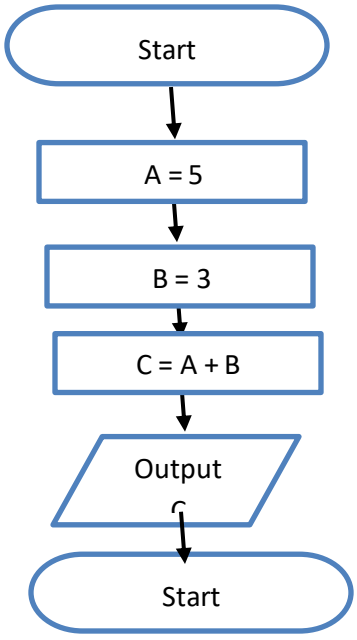
Flowchart

A flowchart is a type of diagram that represents a workflow or process. Flowchart is a graphical representation of a program Programmers often use it as a program-planning tool to solve a problem. It makes use of symbols, which are connected among them to indicate the flow of information and processing. The process of drawing a flowchart for an algorithm is known as “flowcharting”.

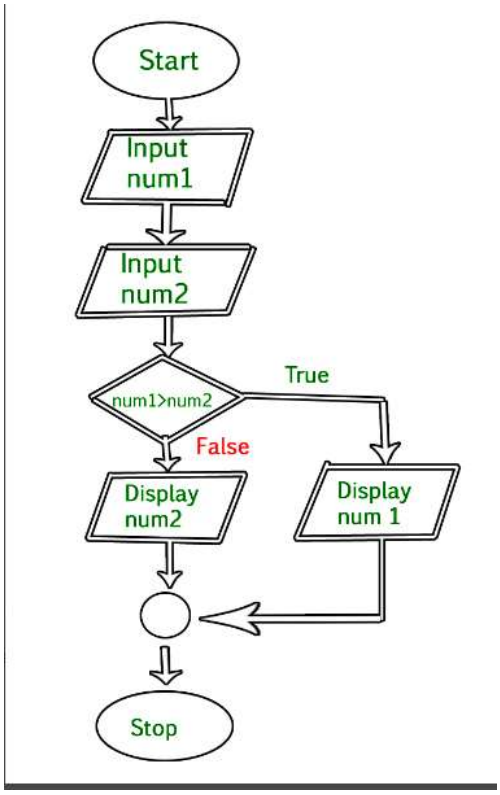
Flowchart Symbol Name	Symbol Shape
Terminator : for Start or End of program	
Process: for processing or calculating	
Decision: for logical processing	
Data input/output: for data input or output	
Document: for print to document	
On-Page Connector: connection to one process to another but on page.	
Off-Page Connector: connection to one process to another but connect to other page	

This example draw a flowchart of program to add two number and display result.





Draw a flowchart to input two numbers from the user and display the largest of two numbers



Exercise

Theory Questions.

1. Block diagram of 8085 Microprocessor.
2. Define Timing and control operation.
3. What is program flowchart?

Practical Questions.

1. Draw a flowchart to input two numbers from the user and display the smallest of two numbers.

Objective and MCQs:

1. How many general-purpose register in 8085 Microprocessor.
   a) 6
   b) 7
   c) 8
   d) 9

2. How many special purpose register in 8085 Microprocessor.
   a) 6
   b) 7
   c) 8
   d) 9

3. Program run start always from _____ register.
   a) SP
   b) A
   c) PC.
   d) TEMP
4. Internal bus has _____ bits in 8085 microprocessor.
   a) 8 bits.
   b) 16 bits.
   c) 64 bits.
   d) 128 bits.

5. The result store always in _____ register.
   a) B
   b) W
   c) L
   d) A