

Microprocessor

Assignment - 1

① Prepare a report on 8085 microprocessor architecture & its functional units.

→ Microprocessor is a controlling unit of a micro-computer, fabricated on a small chip capable of performing ALU (Arithmetic logic unit) operations & communicating with the other connected to it.

The architecture of 8085 microprocessor are :-

① ALU (Arithmetic logic unit)

→ It performs the arithmetic & logic operations & stores it in memory or register.

② Register array

→ It consists of various register identified by letter such as: B, C, D, E, H, L, IX & IY. These registers are used to store data & address temporarily during the execution.

③ Control unit

→ It provides the necessary timing & control signals to all the operations. It controls the flow of data between the microprocessor & memory & peripherals.

④ I/O (Input & output)

→ The input section transfer data & instructions in binary from the outside world to the microprocessor. Eg → Keyboard, scanner, etc. The output section transfers data to output devices such as LED, printer, etc.

⑤ Memory

→ It stores binary information such as instruction & data, & provides the information. When executing, the data is read from memory & performs in the ALU & either displays it in the outer section or stores it.

⑥ System bus

→ It is a communication path between the microprocessor & peripherals.

The functional units of 8085 microprocessor are :-

① Accumulator

→ It is an 8-bit register used to perform arithmetic, logical, I/O & load/store operation. It is connected to internal data bus & ALU.

② ALU

→ It performs all the arithmetic & logical operation.

③ General purpose register

→ There are 6 general purpose register i.e. B, C, D, E, H & L. Each register can hold 8-bit data. These register can work in pair to hold 16-bit data. Their combination is like B-C, D-E & H-L.

④ Program counter

→ A 16-bit register that stores the address of the next executable instruction.

⑤ Stack pointer

→ A 16-bit register i.e. always incremented/decremented by 2 during push & pop operation.

⑥ Flag register.

→ It is an 8-bit register having five 1-bit flip-flop which holds either 0 or 1 depending upon the result stored.

The five 1-bit flip-flops are:

① Sign (S)

② Zero (Z)

③ Auxiliary carry (AC)

④ Parity (P)

⑤ Carry (C)

The bits position is given below:-

D7	D6	D5	D4	D3	D2	D1	D0
S	Z	AC		P			CY

⑦ Temporary register

→ It is a 16-bit register which holds the temporary data of the ALU.

⑧ Instruction register & decoder

→ It is an 8-bit register where instruction is fetched from memory & the decoder decodes the information present in the instruction register.

⑨ Timing & control unit

→ It provides timing & control signal to the microprocessor to perform operations.

The timing & control signals are:-

(a) control signal : READY, RD', WR', ALE

(b) status " : SO, SL, IO/M

(c) DMA " : HOLD, HLDA

(d) Reset " : RESET IN, RESET OUT

⑩ Interrupt control

→ It controls the interrupt signals during the process. When an interrupt signal is detected, the microprocessor shifts the control from the main program to the process of incoming request.

There are 5 interrupt signals: Trap, INTB, RST 7.5, RST 6.5, RST 5.5. When microprocessor detects interrupt signal it sends INTA to the Peripherals.

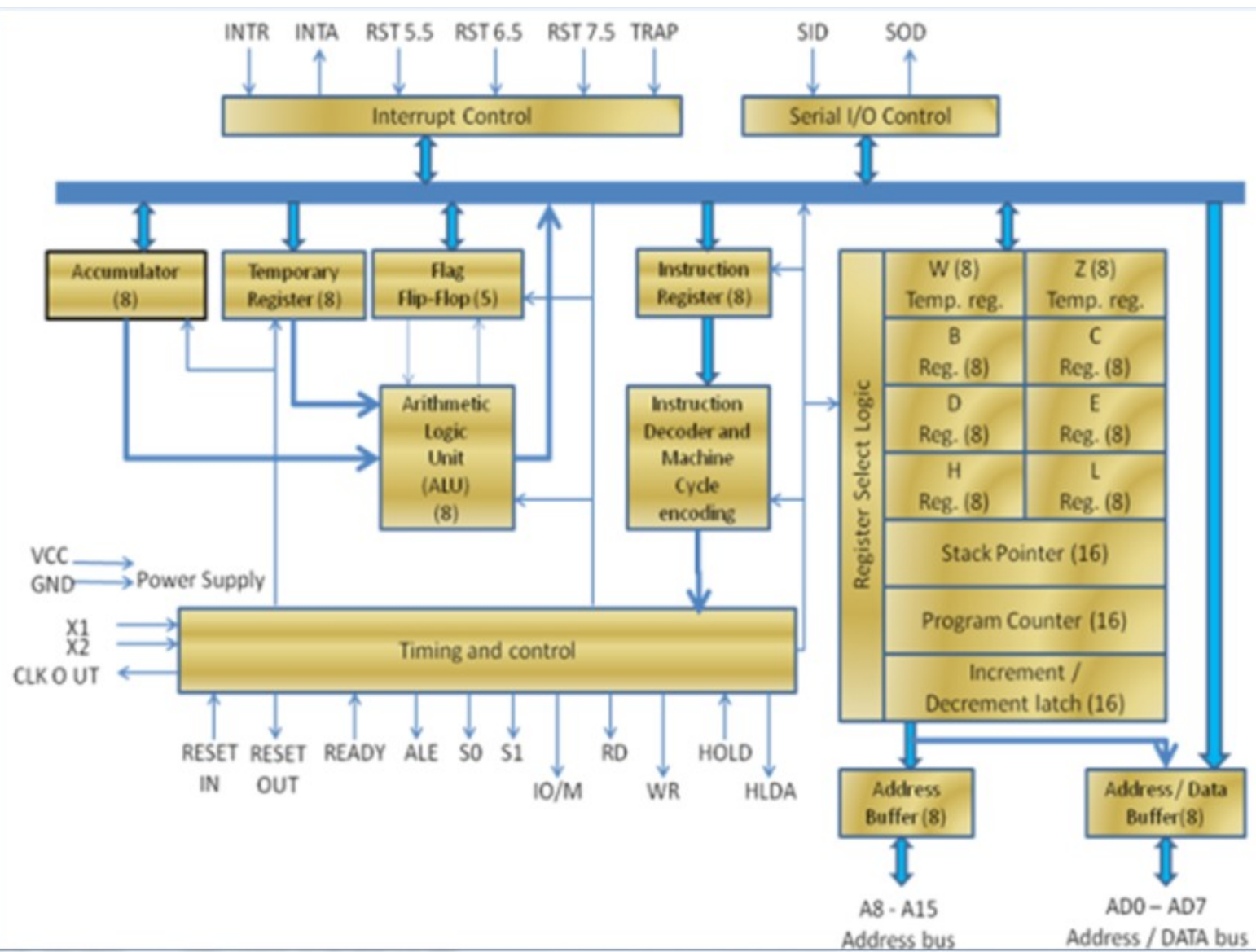


Fig: Block diagram of 8085 Microprocessor.