**8086 ARCHITECTURE**

1. **The Bus Interface Unit (BIU):**
   * It provides the interface of 8086 to external memory and I/O devices via the System Bus.
   * BIU performs the following functions:

* It generates the 20-bit physical address for memory access.
* It fetches instructions from the memory.
* It transfers data to and from the memory and I/O.
* Maintains the 6-byte pre-fetch instruction queue(supports pipelining).
* BIU mainly contains the **4 Segment registers,** the **Instruction Pointer**, a **pre-fetch queue**, and an **Address Generation Circuit**.
* Registers:
* Code Segment register: (16 Bit register):CS holds the base address for the Code Segment. All programs are stored in the Code Segment and accessed via the IP.
* Data Segment register: (16 Bit register):DS holds the base address for the Data Segment.
* Stack Segment register: (16 Bit register): SS holds the base address for the Stack Segment.
* Extra Segment register: (16 Bit register):ES holds the base address for the Extra Segment.
* Instruction Pointer (IP):
* It is a 16-bit register. It holds offset of the next instructions in the Code Segment.
* Address Generation Circuit:
* In BIU, the circuit denoted by the symbol ∑ is called the Address Generation Circuit and it generates 20-bit physical address using the formula:

Physical Address = Segment Address x 10H + Offset Address