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| C(4) | P(4) | A(2) | Total (10) | Sign. |
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Chapter-1.

BASICS OF MICROPROCESSOR

* EVOLUTION OF MICRO-PROCESSOR :

| INTEL MICRO-PROCESSOR | YEAR OF INTRODUCING | NO. of TRANSISTOR | INITIAL CLOCK SPEED. | ADDRESS BUS | DATA BUS (WORD LENGTH) | ADDRESSABLE MEMORY | OTHER COMPANIES PROCESSOR | NO. OF BIT MICRO-PROCESSOR |
|-----------------------|---------------------|-------------------|----------------------|-------------|------------------------|--------------------|-----------------------------------|----------------------------|
| 4004 | 1971 | 2,300 | 108 KHz | 10 bit | 4 bit | 640 bytes | Rockwell International PPS 4 bit. | 4 bit MPR |
| 8008 | 1972 | 3,500 | 200 KHz | 14 bit | 8 bit | 16 Kbytes | Zilog's (z-80, Z-800) | 8 bit MPR |
| 8080 | 1972 | 6000 | 2 MHz | 16 bit | 8 bit | 64 Kbytes | Motoroll (6800, 6809) | |
| 8085 | 1976 | 6500 | 5 MHz | 16 bit | 8 bit | 64 Kbytes | | |
| 8086 | 1978 | 29,000 | 5 MHz | 20 bit | 16 bit | 1 mb | zilog's (z-8000) | 16 Bit MP |

| | | | | | | | | |
|----------------------|------|----------------|------------|--------|------------------------|--------|-------------------------------|---------------|
| 8088 | 1979 | 29,000 | 5 MHz | 20 bit | 16 bit/8 bit inter. | 1 mb | Motorala (68000, 68010) | 16 Bit MP |
| 80286 | 1982 | 134000 | 8 MHz | 24 bit | 16 bit | 16 MB | | |
| 80386 | 1985 | 275000 | 16 MHz | 32 bit | 32 bit | 4 GB | Zilog's | 32 bit MPR |
| 80486 | 1989 | 1.2 million | 25 MHz | 32 bit | 32 bit | 4 GB | (2-80000) | |
| Pentium | 1993 | 3.1 million | 60. MHz | 32 bit | 32 bit | 4 GB | Motorola | |
| Pentium Processor | 1995 | 5.5 million | 150 MHz | 32 bit | 32 bit | 4 GB | (68020 68030) | |
| Pentium II | 1997 | 8.8 million | 233 MHz | 32 bit | 32 bit | 64 GB | | |
| Pentium III | 1999 | 9.5 million | 650 MHz | 32 bit | 32 bit | 64 GB | | |
| Pentium IV | 2000 | 42 million | 1.4 GHz | 32 bit | 32 bit | 64 GB. | | |

* FEATURES OF 8085 :

- 1] Intel 8085 is 8-bit Microprocessor.
- 2] It is developed by intel corporation in 1976.
- 3] It has 40 pin IC fabricated on single chip.
- 4] Maximum clock speed is 3 MHz and minimum clock speed is 500 KHz.



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5] It has 8-bit data bus.

6] It has 16-bit address bus.

7] The intel 8085 uses a single +5v D.C. power supply for its operation.

8] It is designed by using 6200 to 6500 reg.

9] It has 16-bit address lines so it can access $2^{16} = 64$ -Kbytes of memory lines.

10] It has 8-bit I/O addresses.

$2^8 = 256$ (0-255) ports can be accessed.

11] It has 74 basic instructions and 5 addressing modes.

12] It has 5 hardware interrupts and software 8 interrupts.

13] It performs arithmetic and logical operations.

14] It has multiplexed bus.

* PIN DIAGRAM and DESCRIPTION OF 8085 :

| | | | | | |
|-----------------|--------------------------|----|----|--------------------------|------------------|
| X ₁ | <input type="checkbox"/> | 1 | 40 | <input type="checkbox"/> | VCC |
| X ₂ | <input type="checkbox"/> | 2 | 39 | <input type="checkbox"/> | HOLD |
| RESET OUT | <input type="checkbox"/> | 3 | 38 | <input type="checkbox"/> | HDLA |
| SOD | <input type="checkbox"/> | 4 | 37 | <input type="checkbox"/> | CLK |
| SID | <input type="checkbox"/> | 5 | 36 | <input type="checkbox"/> | RESET IN |
| TRAP | <input type="checkbox"/> | 6 | 35 | <input type="checkbox"/> | READY |
| RST 7.5 | <input type="checkbox"/> | 7 | 34 | <input type="checkbox"/> | I/O \bar{M} |
| RST 6.5 | <input type="checkbox"/> | 8 | 33 | <input type="checkbox"/> | SI |
| RST 5.5 | <input type="checkbox"/> | 9 | 32 | <input type="checkbox"/> | \bar{RD} |
| INTR | <input type="checkbox"/> | 10 | 31 | <input type="checkbox"/> | \bar{WR} |
| \bar{INTA} | <input type="checkbox"/> | 11 | 30 | <input type="checkbox"/> | ALE |
| AD ₀ | <input type="checkbox"/> | 12 | 29 | <input type="checkbox"/> | S ₀ |
| AD ₁ | <input type="checkbox"/> | 13 | 28 | <input type="checkbox"/> | AD ₁₅ |
| AD ₂ | <input type="checkbox"/> | 14 | 27 | <input type="checkbox"/> | AD ₁₄ |
| AD ₃ | <input type="checkbox"/> | 15 | 26 | <input type="checkbox"/> | AD ₁₃ |
| AD ₄ | <input type="checkbox"/> | 16 | 25 | <input type="checkbox"/> | AD ₁₂ |
| AD ₅ | <input type="checkbox"/> | 17 | 24 | <input type="checkbox"/> | AD ₁₁ |
| AD ₆ | <input type="checkbox"/> | 18 | 23 | <input type="checkbox"/> | AD ₁₀ |
| AD ₇ | <input type="checkbox"/> | 19 | 22 | <input type="checkbox"/> | AD ₉ |
| V _{SS} | <input type="checkbox"/> | 20 | 21 | <input type="checkbox"/> | AD ₈ |

INTEL
8085



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The 8085 Microprocessor has 40 pins IC and they are as follows :

1) $AD_0 - AD_7$:

This is multiplexed and bidirectional bus. It is used as address as well as data bus. The lower 8-bit address [$A_0 - A_7$] is multiplexed with data bus [$D_0 - D_7$]

2) $AD_8 - AD_{15}$:

This is higher order bus, higher order addresses [$A_8 - A_{15}$] sending through this bus.

3) ALE [Address Latch Enable] :

- It is active high signal.
- It controls multiplexed bus $AD_0 - AD_7$.
- When ALE goes high the $AD_0 - AD_7$ is used as address bus.
- When ALE goes low the $AD_0 - AD_7$ is used as data bus.

4) IO/\bar{M} [Input/output / Memory] :

- It is status signal which determines whether address is for memory or input output device.
- $IO/\bar{M} = \text{high} \rightarrow$ address for IO device
- $IO/\bar{M} = \text{low} \rightarrow$ address for memory.