Microprocessor Technologies - Unit 1 Handwritten Style Notes

UNIT 1 - Revision Notes

UNIT 1: INTRODUCTION TO MICROPROCESSOR-BASED SYSTEM

HISTORY OF MICROPROCESSORS:

- 1971: Intel 4004 - 4-bit
- 1976: Intel 8085 - 8-bit
- 1978: Intel 8086 - 16-bit
- 1985+: 80386 (32-bit), Pentium, Multicore (64-bit+)

ARCHITECTURE OF 8085 MICROPROCESSOR:

- 8-bit processor with 74 instructions and 246 opcodes
- ALU: Performs arithmetic and logic operations
- Registers: A, B, C, D, E, H, L (8-bit), SP & PC (16-bit)
- Flag Register: S, Z, AC, P, CY (used for condition checking)
- Control Unit: Controls operations, sends control signals
- Instruction Decoder: Decodes the fetched instruction

PIN DIAGRAM OF 8085 (40 PINS):

- Address/Data Bus (AD0-AD7) - multiplexed lower 8 bits
- A8-A15: Higher order address bus
- Control Signals: RD, WR, IO/M, ALE, S1, S0
- Clock: X1, X2, CLK OUT
- Power: Vcc, GND

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BUSES IN 8085:

- Address Bus: 16-bit, used to address memory (64 KB)

- Data Bus: 8-bit, for data transfer

- Control Bus: For control signals (RD, WR, etc.)

DEMULTIPLEXING OF BUSES:

- AD0-AD7 carry both address & data

- ALE used to latch address using 74LS373 latch

INSTRUCTION CYCLE, MACHINE CYCLE, T-STATE:

- Instruction Cycle = Fetch + Execute

- Machine Cycle = Memory read/write or I/O operation

- T-State = One clock period

Example: MVI A, 32H

- Opcode Fetch (4 T-states) + Memory Read (3 T-states) = 7 T-states