Microprocessor & Interfacing
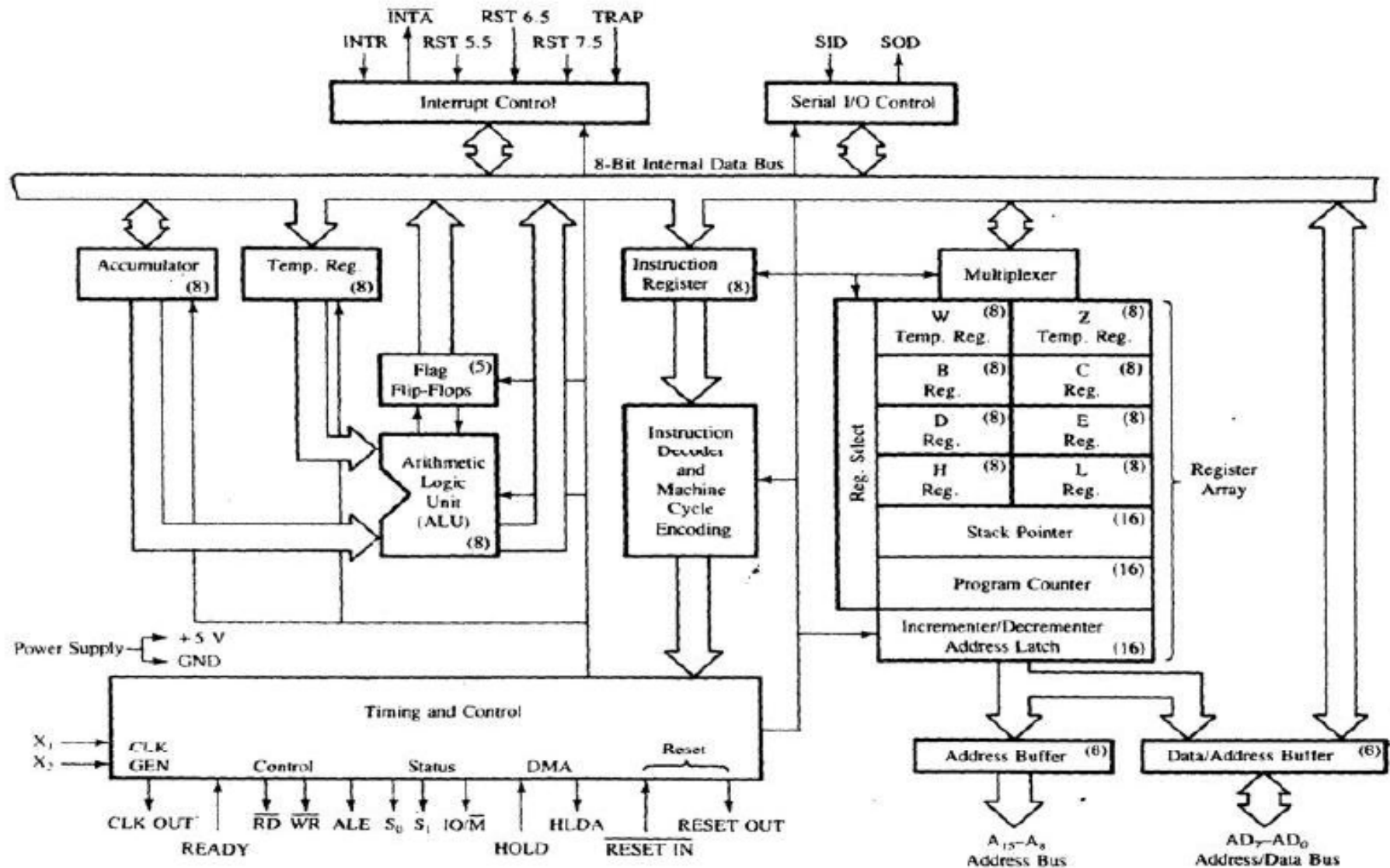## Lecture 1
INTRODUCTION

Contents

- 8085 Microprocessor
- Features
- 8086 Microprocessor
- Block Diagram
- Architecture
- Applications of microprocessor

8085 Microprocessor

Features

- The features of INTEL 8085 are :

1. It is an 8 bit processor.

2. It is a single chip N-MOS device with has 40 pins.

3. It has multiplexed address and data bus.(AD0-AD7).

4. It works on 5 Volt dc power supply.

5. The maximum clock frequency is 3 MHz while minimum frequency is 500kHz.

6. It provides 74 instructions with 5 different addressing modes.

Features Cont..

7. It provides 16 address lines so it can access 2^{16} =64K bytes of memory

8. It generates 8 bit I/O address so it can access 2^8=256 input ports.

9. It provides 5 hardware interrupts: TRAP, RST 5.5, RST 6.5, RST 7.5,INTR.

10. It provides Accumulator ,one flag register ,6 general purpose registers and two special purpose registers(SP, PC).

11. It provides serial lines SID ,SOD. o serial peripherals can be interfaced with 8085 directly.

8086 Microprocessor

1. It is a 16-bit μp.

2. 8086 has a 20 bit address bus, so it can access up to 2^20 = 1 MB Memory Location.

3. It can support up to 64K I/O ports

4. It provides 14, 16 -bit registers.

5. Word size is 16 bits and double word size is 4 bytes.

6. It has multiplexed address and data bus AD0- AD15 and A16 – A19.

7. It requires single phase clock with 33% duty cycle to provide internal timing.

8086 Microprocessor Cont..

8. 8086 is designed to operate in two modes, Minimum and Maximum.

9. It can prefetches up to 6 instruction bytes from memory and queues them in order to speed up instruction execution.

10. It requires +5V power supply.

11. A 40 pin dual in line package.

12. Address ranges from 00000H to FFFFFH

13. Memory is byte addressable - Every byte has a separate address.

8086 Block Diagram
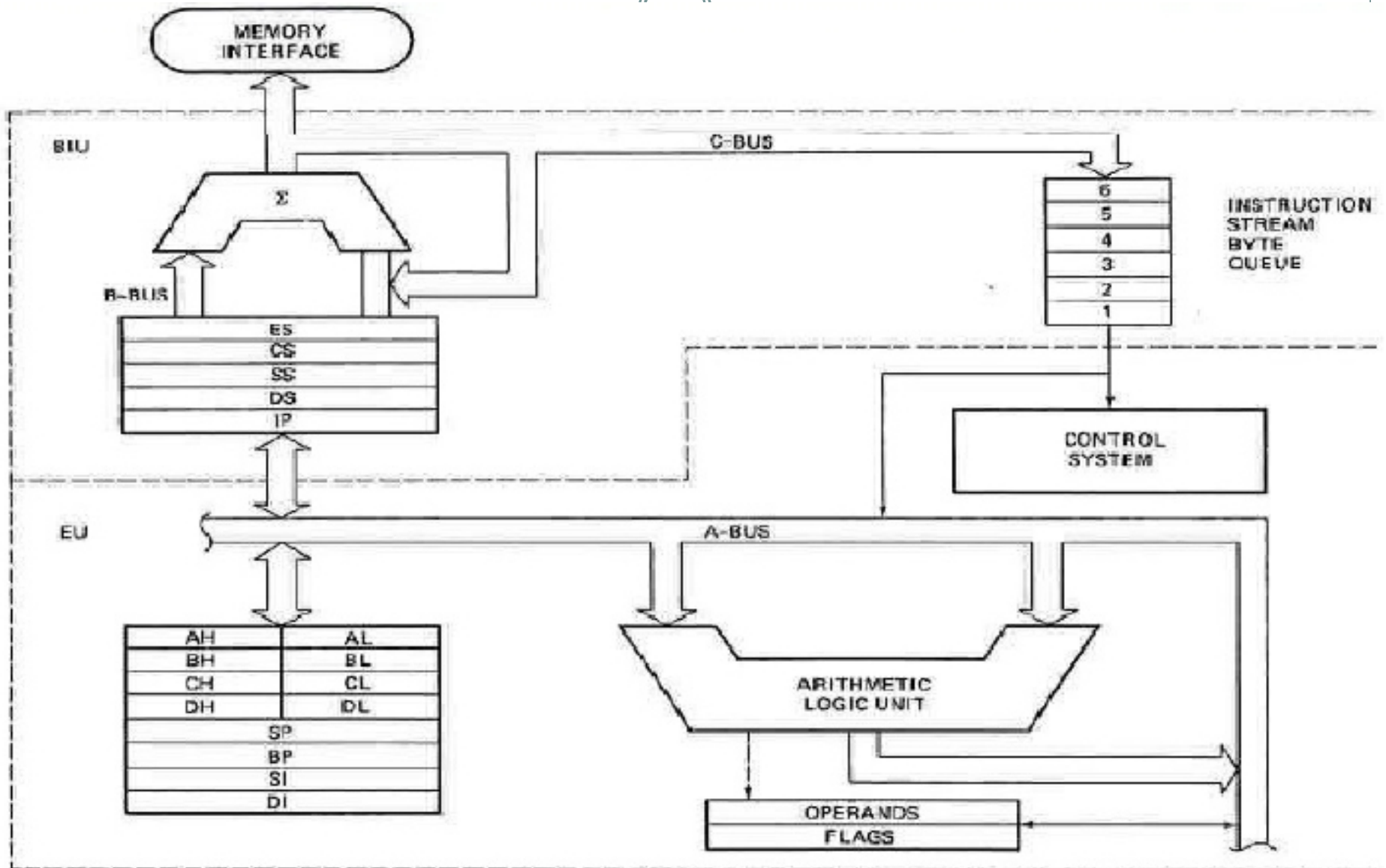
Architecture of 8086

Internal architecture of 8086

- 8086 has two blocks BIU and EU.

- The BIU handles all transactions of data and addresses on the buses for EU.

- The BIU performs all bus operations such as instruction fetching, reading and writing operands for memory and calculating the addresses of the memory operands. The instruction bytes are transferred to the instruction queue.

- EU executes instructions from the instruction system byte queue.

Architecture of 8086 Cont..

- Both units operate asynchronously to give the 8086 an overlapping instruction fetch and execution mechanism which is called as Pipelining. This results in efficient use of the system bus and system performance.

- BIU contains Instruction queue, Segment registers, Instruction pointer, Address adder.

- EU contains Control circuitry, Instruction decoder, ALU, Pointer and Index register, Flag register.

Execution Unit

- EXECUTION UNIT

- Decodes instructions fetched by the BIU

- Generate control signals,

- Executes instructions. The main parts are:

- Control Circuitry

- Instruction decoder

- ALU

Interface Devices

1.8255 programmable peripheral interface.

2.8259 Programmable interrupt controller.

3.8237 (DMA) direct memory access.

4.8254/8253 programmable interval timer.

Applications of Microprocessor

- To day word can not imagine without microprocessor, microprocessors are using all most every field where computer is using such as education, business, entertainment, research, Science etc.

Scope of Research

- There are lot of scope in microprocessor research
- Here we can develop new application of microprocessor.
- Develop microcontroller.
- Enhance the feature of microprocessor.