8086 Microprocessor is an enhanced version of 8085Microprocessor that was designed by Intel in 1976. It is a 16-bit Microprocessor having 20 address lines and16 data lines that provides up to 1MB storage. It consists of powerful instruction set, which provides operations like multiplication and division easily. It supports two modes of operation, i.e. Maximum mode and Minimum mode. Maximum mode is suitable for system having multiple processors and Minimum mode is suitable for system having a single processor.

Features of 8086

The most prominent features of a 8086 microprocessor are as follows –

• It has an instruction queue, which is capable of storing six instruction bytes from the memory resulting in faster processing.

• It was the first 16-bit processor having 16-bit ALU, 16-bit registers, internal data bus, and 16-bit external data bus resulting in faster processing.

• It is available in 3 versions based on the frequency of operation –

o 8086 → 5MHz

o 8086-2 → 8MHz

o (c)8086-1 → 10 MHz

• It uses two stages of pipelining, i.e. Fetch Stage and Execute Stage, which improves performance.

• Fetch stage can prefetch up to 6 bytes of instructions and stores them in the queue.

• Execute stage executes these instructions.

- It has 256 vectored interrupts.

- It consists of 29,000 transistors.

Architecture of 8086 The following diagram depicts the architecture of a 8086 Microprocessor

8086 Internal Architecture
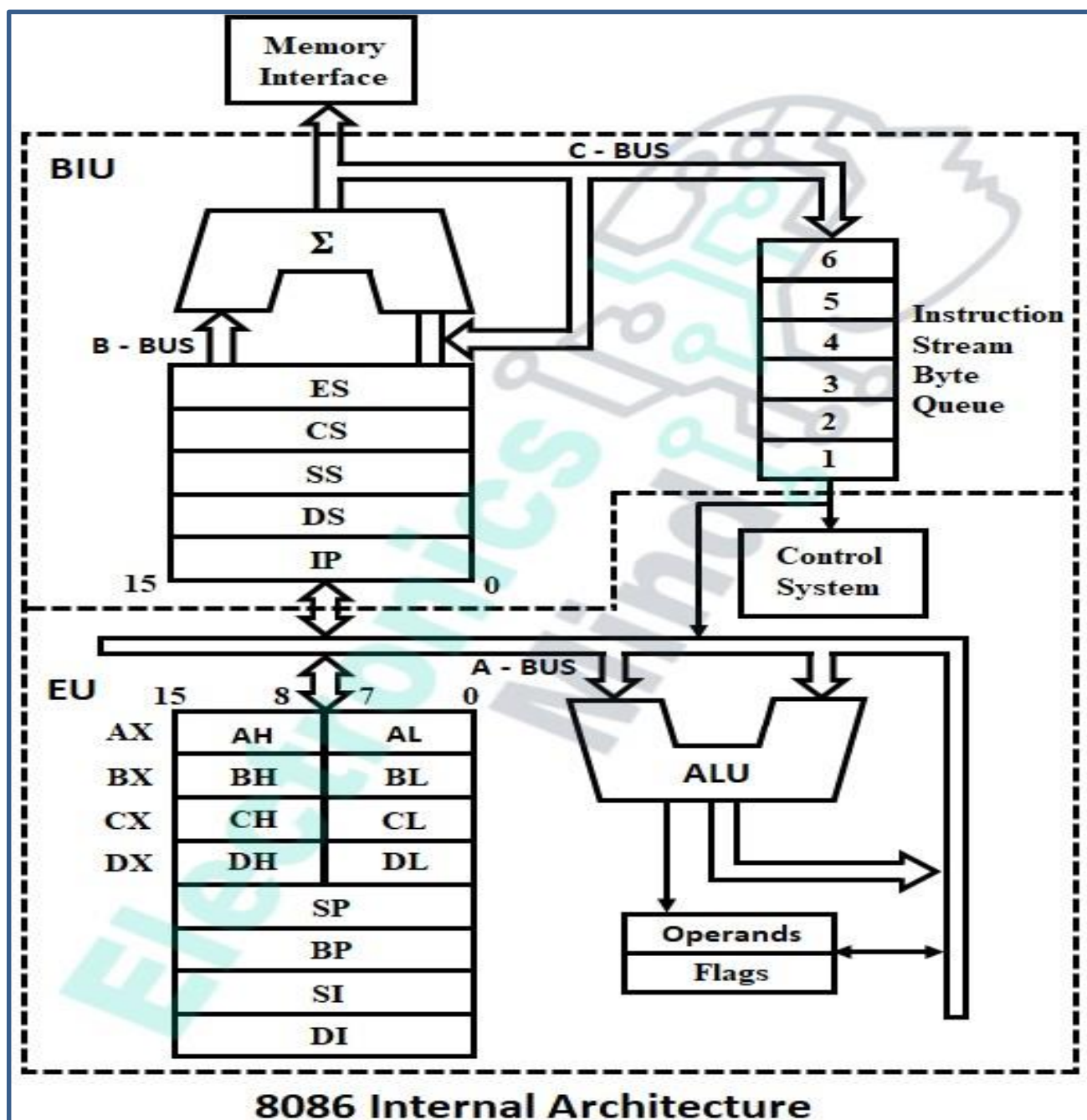
– Some terms and concepts for digitals computers

Nibble   4 bit

Byte   8 bit

Word   16 bit =2 byte

Double Word = 32 bit =4 byte

Data transfer instructions of 8086 microprocessor

General purpose byte or word transfer instructions:

• MOV: copy byte or word from specified source to specified destination

• PUSH: copy specified word to top of stack.

• POP: copy word from top of stack to specified location

• PUSHA: copy all registers to stack

• POPA: copy words from stack to all registers.

• XCHG: Exchange bytes or exchange words These are I/O port transfer instructions:

• IN: copy a byte or word from specific port to accumulator

• OUT: copy a byte or word from accumulator to specific port Special address transfer Instructions:

• LEA: load effective address of operand into specified register

• LDS: load DS register and other specified register from memory

• LES: load ES register and other specified register from memory Flag transfer instructions:

• LAHF: load AH with the low byte of flag register

• SAHF: Stores AH register to low byte of flag register

• PUSHF: copy flag register to top of stack

• POPF: copy top of stack word to flag register

E-mail : sarah.sadoon.abass@uomus.edu.iq