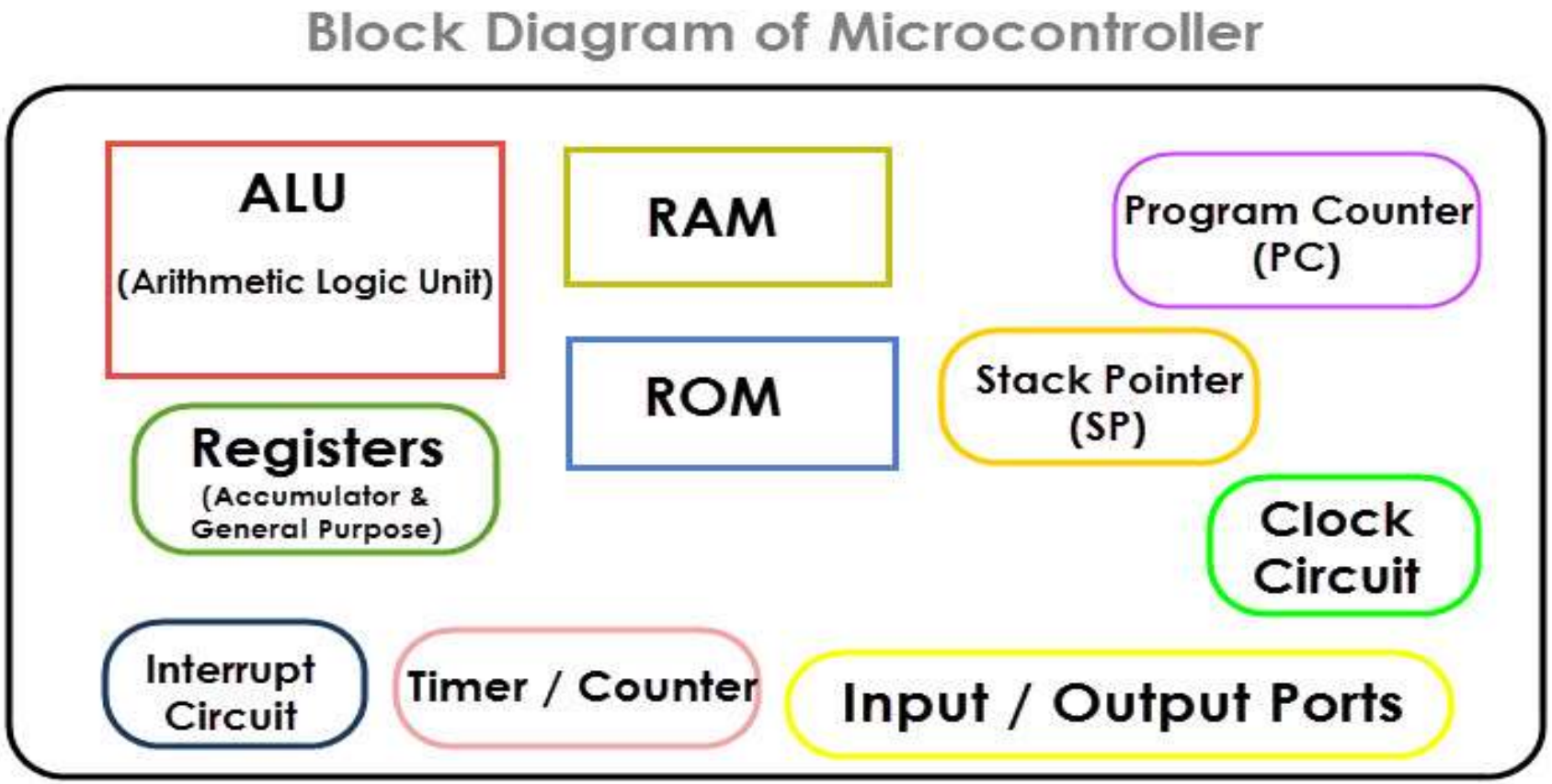
Lecture -3

MICROCONTROLLER

- small and low-cost microcomputer
- designed to perform the specific tasks of embedded systems(displaying microwave's information, receiving remote signals, etc).
- The general microcontroller consists of
  - processor
  - memory (RAM, ROM, EPROM)
  - Serial ports
  - peripherals (timers, counters)

MICROCONTROLLER



MICROCONTROLLER-8051 ARCHITECTURE

- 8051 microcontroller is designed by Intel in 1981.
- On-chip crystal oscillator is integrated in the microcontroller having crystal frequency of 12 MHz.
- Technically called as Intel MCS-51 Architecture, the 8051 microcontroller series was developed by Intel in the year 1980.
- 8 – bit CPU with two Registers A (Accumulator) and B.
- Internal ROM of 8K Bytes – It is a flash memory that supports in – system programming.
- Internal RAM of 256 Bytes – The first 128 Bytes of the RAM i.e. 00H to 7FH is again divided in to 4 banks with 8 registers (R0 – R7) in each bank, 16 bit addressable registers and 80 general purpose registers. The higher 128 Bytes of the RAM i.e. 80H to FFH consists of SFRs or Special Function Registers.

CONTD….

- Using SFRs we can control different peripherals like Timers, Serial Port, all I/O Ports, etc.
- consists of are four parallel 8-bit ports, which are programmable as well as addressable as per the requirement.
- 32 I/O Pins (Input / Output Pins) – Arranged as 4 Ports: P0, P1, P2 and P3.
- 8- bit Stack Pointer (SP) and Processor Status Word (PSW).
- 16 – bit Program Counter (PC) and Data Pointer (DPTR).
- Two 16 – bit Timers / Counters – T0 and T1.
- Control Registers – SCON, PCON, TCON, TMOD, IP and IE.
- Serial Data Transmitter and Receiver for Full – Duplex Operation – SBUF.
- Interrupts: Two External and Three Internal.
- Oscillator and Clock Circuit.