8051 MICRO CONTROLLER

MICRO CONTROLLERS VS MICROPROCESSORS

MICROPROCESSOR:

A CPU built into a single VLSI chip is called a microprocessor.

It is a general-purpose device and additional external circuitry is added to make it a microcomputer.

The microprocessor contains arithmetic and logic unit (ALU), Instruction decoder and control unit, Instruction register, Program counter (PC), clock circuit (internal or external), reset circuit (internal or external) and registers.

But the microprocessor has no on chip I/O Ports, Timers, Memory etc.

For example, Intel 8085 is an 8-bit microprocessor and Intel 8086/8088 a 16-bit microprocessor.

MICROCONTROLLER:

A microcontroller is a highly integrated single chip, which consists of on chip CPU (Central Processing Unit), RAM (Random Access Memory), EPROM/PROM/ROM (Erasable Programmable Read Only Memory), I/O (input/output) – serial and parallel, timers, interrupt controller.

For example, Intel 8051 is 8-bit microcontroller and Intel 8096 is 16-bit microcontroller.

DISTINGUISH BETWEEN MICROPROCESSOR AND MICROCONTROLLER:

S. No	Microprocessor	Microcontroller
1	A microprocessor is a general purpose device which is called a CPU .	A microcontroller is a dedicated chip which is also called single chip computer.
2	A microprocessor do not contain on chip I/O Ports, Timers, Memories etc..	A microcontroller includes RAM, ROM, serial and parallel interface, timers, interrupt circuitry (in addition to CPU) in a single chip.
3	Microprocessors are most commonly used as the CPU in microcomputer systems.	Microcontrollers are used in small, minimum component designs performing control – oriented applications.
4	Microprocessor instructions are mainly nibble or byte addressable.	Microcontroller instructions are both bit addressable as well as byte addressable.
5	Microprocessor instruction sets are mainly intended for catering to large volumes of data.	Microcontrollers have instruction sets catering to the control of inputs and outputs.
6	Microprocessor based system design is complex and expensive .	Microcontroller based system design is rather simple and cost effective.
7	The Instruction set of microprocessor is complex with large number of instructions.	The instruction set of a Microcontroller is very simple with less number of instructions. For, ex: PIC microcontrollers have only 35 instructions.
8	A microprocessor has zero status flag.	A microcontroller has no zero flag.