



12TH HSC INTRODUCTION TO MICROCONTROLLER

CS Academy by Ketaki

What is the microcontroller. Explain in short.

- A microcontroller is a complete microprocessor system , consisting of microprocessor , limited amount of ROM or EPROM , RAM and I/P ports built on a single integrated circuit.
- Microcontroller is in fact microcomputer , but it is called so because it is used to perform control function .
- The designer of a microcontroller identify all the needs to build a simple microprocessor system and puts as many as possible in a single IC.

Microcontroller :

- For example a microcontroller must include full or nearly full implementation of a standard microprocessor ,ROM Or EPROM , RAM , parallel I/O ports , timer , a clock , serial ports.
- A microcontroller is more complex than a microprocessor because it consist of many I/O components.
- E.g. Intels 8048, 8051.

Advantage of microcontroller over microprocessor-based system:

- The cost of microcontroller is less than a microprocessor –based system .
- A microcontroller has more I/o components than microprocessor – based system .
- Microcontroller can be used in wide variety of intelligents products such as in personal computer key-board . Microprocessor based systems cannot be used in such intelligent products.
- Many low cost product such as electronic toys , electric drills, microwave ovens, VCRs are based on microcontroller. This is not the case with microprocessor based system.



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MAIN FEATURE OF MICROCONTROLLER 8051

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The main feature of microcontroller of 8051 are as listed below.

- The 8051 microcontroller has an 8 bit ALU .
- The 8051 has 4k byte ROM and EPROM.
- The 8051 has 128k byte RAM.
- It has dual 16 bit timer event counter .
- It has 32 I/O lines for 8 bit I/O ports .

Next points :-

- It can be address 64 bit of program memory .
- It can be address 64 KB of data memory .
- It has powerful instruction set, consisting of 111 instructions.
- It has two external interrupts .
- The 8051 has clock upto 12- MHz frequency .
- Full- featured serial port.



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MICROCONTROLLER

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Remaining points :-

- Some application required simple timing and bit reset/set function ; other requires high speed data processing capability .
- Many low cost products such as electronic toys microwave ovens , VCRs are based on microcontroller .
- A home security system , a tape deck and intelligent multimeter can also be build by using microcontroller .
- The person computer keyboards are implemented with a microcontroller . It replies scanning , debounce , matrix decoding and serial transmission circuits.

Explanation of various type of microcontroller .

- Microcontroller is single type chip microcomputer .
- They are used as independent controller in machine or as slaves in distributed processing .
- They are used as machine tools chemical processors medical instrumentation and sophisticated guidance control.

Differentiate between microcontroller and microprocessor .

Microcontroller

- Microcontroller is chip which is called single chip computer .
- Microcontroller include RAM ,I/O, ROM , Timer in a single chip .
- microcontroller based system designed is simple and cost effective .
- Microcontroller have no advantage of designing RAM, ROM, I/O ports .

Microprocessor

- A microprocessor is a general purpose device which is called a CPU.
- microprocessor do not contain on chip I/O ports , timer memories ,etc.
- Microprocessor based system designer is complex and expensive .
- Microprocessor have advantage of versatility such that designer can decide the amount of ROM and I/O port as needed .



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