

CC XIII : MICROCONTROLLERS

Unit I : Introduction to Microcontrollers

Microcontroller survey – 4, 8, 16, 32 bit micro controllers – Intel 8051 microcontroller – Block Diagram, pin out – oscillator and clock – Program Counter and Data pointer, A and B registers, flags and program status word – Internal RAM – the Stack and Stack pointer –special functions registers – Internal ROM – I/O Pins, ports and circuits – External memory.

Unit II : Counters, Timers and Addressing Modes

Timer counter interrupts – Timing – Timer – Modes of operation – Counting – Addressing – Immediate addressing modes – Register addressing modes – Direct addressing modes – Indirect addressing modes.

Unit III : Instruction Sets

Data exchanges – Logical operations – Byte level operation – Bit level logical operations – Rotate and swap operations – Arithmetic operations – Jump and call instructions – Jump and call program range – Jumps – Calls and subroutines – Interrupts and return.

Unit IV : Assembly Language Programming

Assembly Language programming for 8051 Micro controller family – Programs : 8–Bit addition – 8–Bit subtraction – 8–Bit Multiplication – 8–Bit Division – Greatest and smallest number in an array – ascending and Descending – Delay –Routines – Calculation of Time delay – Block data transfer.

Unit V : Applications

Interfacing Keyboard –Scanning programs for small keyboards – Interfacing LED, LCD Display – Pulse measurement and pulse width measurement – A/D and D/A Interfacing.

Books for Study

1. 8051 Micro controller Architecture, Kennath J. Ayala, Programming and applications, Penram International Publishing
2. Microprocessor and Digital Systems, A. Gaonkar, – McGraw Hill

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1. Microprocessor and Digital Systems, D.V. Hall - McGraw Hill
2. Microprocessor Principles and Applications – 2nd Edition, Gilmore – Tata McGraw Hill.