34052 MICROCONTROLLER

DETAILED SYLLABUS

UNIT I ARCHITECTURE & INSTRUCTION SET OF 8051

1.1 ARCHITECTURE OF 8051

Comparison of Microprocessor and Microcontroller - Block diagram of Microcontroller –Functions of each block - Pin details of 8051 – ALU – ROM– RAM – Memory Organization of 8051 - Special function registers –Program Counter – PSW register – Stack - I/O Ports – Timer – Interrupt – Serial Port – Oscillator and Clock - Clock Cycle – State - Machine Cycle –Instruction cycle – Reset – Power on Reset – Overview of 8051 family

1.2 INSTRUCTION SET OF 8051

Instruction set of 8051 – Classification of 8051 Instructions - Data transfer instructions – Arithmetic Instructions – Logical instructions – Branching instructions – Bit Manipulation Instructions

UNIT II PROGRAMMING EXAMPLES:

2.1 ASSEMBLER AND ADDRESSING MODES

Assembling and running an 8051 program –Structure of Assembly Language –Assembler directives - Different addressing modes of 8051

2.2 PROGRAMMES

Multibyte Addition – 8 Bit Multiplication and Division – Biggest Number / Smallest Number – Ascending order / Descending order BCD to ASCII Conversion – ASCII to Binary Conversion – Odd Parity Generator – Even Parity Generator -Time delay routines

UNIT III I/O AND TIMER:

3.1 I/O

Bit addresses for I/O and RAM – I/O programming – I/O bit manipulation programming. 3.2 TIMER Programming 8051 Timers – Timer 0 and Timer 1 registers – Different modes of Timer – Mode 0 Programming – Mode 1 Programming - Mode 2Programming - Counter

programming – Different modes of Counter – Mode 0 Programming – Mode 1 Programming -Mode 2 Programming (simple programs)

UNIT IV INTERRUPT AND SERIAL COMMUNICATION

4.1 SERIAL COMMUNICATION

Basics of Serial programming – RS 232 Standards - 8051 connection to RS 232 – 8051 Serial Communication Programming – Programming 8051 to transmit data serially - Programming 8051 to Receive data serially.

4.2 INTERRUPT

8051 Interrupt s – Programming Timer Interrupts – Programming external hardware interrupts – Programming the serial communication interrupt –Interrupt priority in 8051 (simple programs).

UNIT V INTERFACING TECHNIQUES

5.1. IC 8255

IC 8255 - Block Diagram - Modes of 8255.

5.2. INTERFACING TECHNIQUES

Interfacing external memory to 8051– 8051 interfacing with the 8255 – ASM Programming – Relays – Sensor interfacing – ADC interfacing – DAC interfacing - Keyboard interfacing – Seven segment LED Display Interfacing - Stepper Motor interfacing – DC motor interfacing using PWM

TEXT BOOKS:

1) Microcontrollers, Principles and Applications – Ajit pal – PHI Ltd., - 2011.

REFERENCE BOOKS:

1) 8051 Microcontroller and Embedded Systems using Assembly and C by Mazidi,Mazidi and D.MacKinlay, 2006 Pearson Education Low Price Edition.