

# AMI10 MICROPROCESSORS

## UNIT-1 MICROPROCESSOR ARCHITECTURE AND MICROCOMPUTER SYSTEM

- 1.1 The microprocessor is a programmable logic device, designed with registers, flip-flops, and timing elements, memory, r/wm (read/write memory),
- 1.2 Rom (read-only memory), ee-prom (electrically erasable prom), recent advances in memory technology, input and output (i/o) devices, example of a microcomputer system,
- 1.3 Review: logic devices for interfacing, examples of latches.

## UNIT-2 8086 MICROPROCESSOR ARCHITECTURE AND MEMORY INTER-FACING

- 1.1 The 8085 mpu, address bus, multiplexed address/data bus, control and status signals, power supply and clock frequency, externally initiated signals, serial i/o ports, the alu,
- 1.2 Timing and control unit, instruction register and decoder, register array, example of an 8085-based microcomputer, memory interfacing, the sdk-85 memory system
- 1.3 How does an 8085-based single-board microcomputer work?

## UNIT-3 INTERFACING I/O DEVICES

- 3.1 Basic interfacing concepts, out instruction (8085), in instruction, interfacing output displays, circuit analysis, program, program description, problem statement,
- 3.2 Hardware description, seven-segment led, interfacing circuit and its analysis, interfacing input devices, memory-mapped i/o, execution of memory-related data transfer instructions,
- 3.3 Output port and its address, input port and its address, testing and troubleshooting i/o interfacing circuits, some questions and answers.

## UNIT-4 INTERRUPTS

- 4.1 The 8085 interrupt, rst (restart) instructions, problem statement, main program, description of the interrupt process, testing interrupt on a single-board computer system,
- 4.2 Issues in implementing interrupts, 8085 vectored interrupts, trap, rst 7.5, 6.5, and 5.5, triggering levels, pending interrupts, problem statement, hardware description,
- 4.3 Monitor program, main program, program description, internet service routine, restart as software instructions, problem statement, problem analysis, breakpoint subroutine,
- 4.4 Program description, additional I/O concepts and processes, 8259a interrupt operation.

## UNIT-5 INTERFACING DATA CONVERTERS

- 5.1 Digital-to-analog (d/a) converters, r/2r ladder network, problem statement, hardware description, program, operating the d/a converter in a bipolar range, hardware description,
- 5.2 Analog-to-digital (aid) converters, interfacing an 8-bit a/d converter using status check, hardware description, interfacing circuit, service routine, dual-slope a/d converters.

## UNIT-6 SDK-85 PROGRAMMABLE INTERFACE DEVICES

- 6.1 Basic concepts in programmable devices, data input with handshake, data output with handshake, the 8155/8156 and 8355/8755 multipurpose programmable devices,

- 6.2 Control logic, the 8155 i/o ports, chip enable logic and port addresses, control word, hardware description, control word, program description, problem statement,
- 6.3 Control signals in handshake mode, input, output, status word, problem statement, problem analysis, port addresses, and program description, interrupt i/o.

### **UNIT-7 GENERAL-PURPOSE PROGRAMMABLE PERIPHERAL DEVICE**

- 7.1 The 8255a programmable peripheral interface, control logic, bsr control word, port address, subroutine, problem statement, problem analysis, Mode 0: control word,
- 7.2 Bsr control word for start pulse, subroutine, program description, mode 1: input control signals, control and status words, programming the 8255a in mode 1, mode 1: output control signals,
- 7.3 Control and status words, problem statement, program description, illustration: interfacing keyboard and seven-segment display, Key debounce,
- 7.4 Illustration : bidirectional data transfer between two microcomputers, data transfer from master mpu to slave mpu, data transfer from slave to master mpu, control word-mode 2,
- 7.5 Status word-mode 2, read and write operations of the slave mpu, program comments, slave program, The 8254 (8253) Programmable Interval Timer, Data Bus Buffer, Control Logic,

### **UNIT-8 SERIAL I/O AND DATA COMMUNICATION**

- 8.1 Basic concepts in serial i/o, Synchronous vs, Asynchronous transmission, Simplex and duplex transmission, Rate of transmission (baud), Parity check, Checksum,
- 8.2 Cyclic redundancy check (crc), Software-controlled asynchronous serial i/o, Serial output data (sod), Serial input data (sid), Hardware-controlled serial i/o using programmable chips,
- 8.3 Read/write control logic and registers, Transmitter section, Receiver section, Initializing the 8251a, Program description.

### **UNIT-9 MICROPROCESSOR APPLICATION**

- 9.1 Designing scanned displays, Sn 75491-segment driver, Sn 75492-digit driver, Interfacing a matrix keyboard, Keyboard subroutine, Mm74c923 keyboard encoder, Memory design,
- 9.2 Eprom memory, Wait state calculations, 8086 mpu design, Address bus, Data bus, Control signals, Frequency and power requirements, Externally triggered signals, Designing a system:
- 9.3 single-board microcomputer, Keyboard, Display, Execute, System buses and their driving capacity, Keyboard and displays, Software design, Program coding.

### **UNIT-10 INTRODUCTION TO 8085 ASSEMBLY LANGUAGE PROGRAMMING**

- 10.1 The 8085 programming model, registers, accumulator, flags, program counter (pc), stack pointer (sp), instruction classification, data transfer (copy) operations,
- 10.2 Arithmetic operations, logical operations, branching operations, machine control operations, instruction format, one-byte instructions, two-byte instructions, three-byte instructions.

#### **Reference Books:**

1. Microprocessor and interfacing with application, Publisher Katsons, Writer Ashutosh gupta
2. Microprocessor and interfacing, Publisher Katsons, Writer Nikhil Mariwala