Tutorial 1

CHAPTER 1: INTRODUCTION

1. Explain the evolution of intel series microprocessors from 16-bit to 64 bit microprocessors.
2. Differentiate between microprocessors, microcomputer and microcontrollers.
3. Explain the applications of microprocessors.

Tutorial 2

CHAPTER 2: 8085 MICROPROCESSOR

1. Explain the block diagram of 8085 microprocessor.
2. That are the functions of the following 8085 pins: INTR, ALE, HOLD,TRAP, RESET
3. Explain 8085 flag register in detail.
4. What do you mean by addressing modes? Explain 8085 addressing modes.
5. Identify size, adressing mode, machine cycles and functions of following 8085 instructions:
    MVI A, 32H
    LDA 1234H
    STAX D
    MOV M, B
    RLC
    MOV B, C
    ADI 40H
    LXI H, 1234H
6. Draw timing diagram for the following 8085 instructions and also determine the time taken to execute the instruction if the clock frequency of 8085 is 10MHz.
    MVI A, 32H
    LDA 2072H
    STA 2073H
    IN 40H
    OUT 50H
    LXI H, 1234H
7. What do you mean by instruction cycle, machine cycle and T-states.

Tutorial 3

CHAPTER 2: 8085 PROGRAMMING

1. Write 8085 ALP to transfer 10 bytes of data starting from memory location 2070H to memory locations starting from 2080H.
2. Write 8085 ALP to count number of 1's in a given byte of data.
3. Write 8085 ALP to count number of negative numbers stored in an array of 30 bytes stored in memory location starting from 2072H.
4. Write 8085 ALP to multiply any two bytes and store result in memory locations starting from C000H.
5. Write 8085 ALP to divide an even byte by 2 and store result in memory location 2072H.
6. Write 8085 ALP to count number of bytes less than 10H or greater than 20H from an array of 20 bytes stored from memory locations 2070H.
7. Write 8085 ALP to add two 16-bit numbers and store result starting from memory location C000H.
8. Write 8085 ALP to check whether the content of memory location AAAAH is odd or even. If it is odd store 00H in memory location AAABH else store FFH in AAACH.
9. Write 8085 ALP to find the factorial of a number.
10. Write 8085 ALP to take input from input port 80H, check whether the input data is positive or negative and send the input data to output port 81H if it is positive.

Tutorial 4

CHAPTER 3: 8086 MICROPROCESSOR

1. Draw the block diagram of 8086 Microprocessor and explain it.
2. Explain the flag register of 8086 micropprocessor.
3. What do you mean by addressing modes? Explain the addressing mode of 8086 microprocessors.
4. Explain minimum mode of operation of 8086 with read and write cycle timing diagrams.
5. Explain maximum mode of operation of 886 with read and write cycle timing diagrams.
6. What do you mean by assembly language programming. What are its advantages? Explain ALP development tools.
7. What is assembler directive. Why assembler directives are called pseudo-codes? Explain 8086 assembler directives.
8. Explain types of assemblers.
9. What do you mean by modular programming? Which is better in ALP: macros or procedures? Justify your answer.
10. If DS=1000H, BX=2000H, SI=3000H, DI=4000H and BP=5000H then find the physical address of the source in the following instructions and write its addressing mode.
    MOV AX, [1234H]
    MOV AX, [BX]
    MOV AX, [BX+SI]
    MOV AX, [BP+4]
    MOV AX, [BX+DI+4]
11." 8086 Microprocessor has feature of instruction pipelining". Is this statement true or false. Justify your answer.

Tutorial 5

CHAPTER 3: 8086 PROGRAMMING

1. Write an assembly language program to convert ASCII value to hexadecimal equivalent.
2. Write an assembly language program to convert the given hexadecimal values into its ASCII equivalent values.
3. Write an assembly language program to find the sum of two no. which is input by the user through the key board and display the sum in screen.
4. Write an assembly language program to find the no. of negative data in the given series.
5. Write an assembly language program to sum the numbers from 1 to 100.
6. Write an assembly language program to read a string and display it into a standard output device
7. Write A.L.P to print the Sum of Even number up to 10.
8. Write A.L.P to print the string in reverse order.
9. Write an assembly language program to count the number of vowels in a given string.
10. Write an assembly language program to convert the single digit HEX content to an ASCII character.
11. Write an A.L.P, to print
'Microprocessor'
'And'
'Assembly language programming'
In three different lines
12. A set of ten bytes are stored in memory starting with the address C000H. Write an assembly language program for 8086 to check each byte, and save the bytes that are higher than 50H and lower than 80H in memory location starting from D000H.
13. Write a program for 8086 assembler to accept a string from the keyboard and compare that with the string 'microprocessor'. If the string is equal display 'welcome' else display 'try again'.
14. Write an assembly language program to concatenate two different strings 'string 1' and 'string 2' and put the result in the 'string 3'.
15. You have given string data 'Microprocessor and Assembly language Programming'. Write an ALP to print 'Microprocessor Programming' from the above given data.
16. You have given two strings 'Microprocessor Programming' and 'Assembly Language'. Write an ALP to print 'Microprocessor Assembly language Programming' using the above given strings.
17. Write an ALP to input a string and check whether the input string is PALINDROME or not. If yes display 'PALINDROME' otherwise display 'NOT PALINDROME'.
18. Write an ALP to print first 10 numbers of a FIBONACCI series.
19. Write an ALP to print factorial of a given number.

Tutorial 6

CHAPTER 4: BUS STRUCTURE AND MEMORY DEVICES

1. What do you mean by address decoding? Differentiate between partial and full address decoding.
2. Differentiate between synchronous and asynchronous bus.
3. Design an address decoding circuit to interface 8085 microprocessor with 16KB RAM, 8KB ROM and 4 KB EEPROM.
4. Design an address decoding circuit to interface 16KB RAM, 8KB ROM and 4 KB EEPROM with starting address 8000H.
5. Design an address decoding circuit to interface 2K*8 RAM, 4K*8 ROM and 16K*8 RAM with 8085 microprocessor with starting address C000H.
6. Design an address decoding circuit to interface 4KB RAM, 8255A PPI and 8254 PIT with 8085 microprocessor. Find the address for each port, control register of 8255A PPI and each counter and control register of 8254 PIT.

Tutorial 7

CHAPTER 5: INTERRUPTS

1. What is an interrupt? Explain how interrupt is processed by a microprocessor.
2. What is ISR? Explain the sources of interrupts with examples.
3. Differentiate between maskable, non-maskable interrupts and vectored, non-vectored interrupts.
4. What do you mean by IVT. Explain.
5. Explain 8086 predefined interrupts.
6. What are the applications of Non-maskable interrupts. Explain with a suitable example.
7. What do you mean by Vectored and Pooled Interrupts.
8. Explain various interrupts of 8085 Microprocessor.

Tutorial 8

CHAPTER 6: IO INTERFACES

1. Draw the block diagram of following devices and explain.
    8255 PPI
    8254 PIT
    8259 PIC
    8251 USART
    8237 DMA Controller
2. How can you handle 18 interrupts using 8259 PIC. Explain.
3. What do you mean by DMA. Explain DMA transfer with the help of 8237 DMA Controller.
4. Explain various modes of operation of 8254 PIT.
5. Explain modes of operation of 8259 PIC.
6. Explain modes of operation of 8255 PPI.
7. Draw the format of control word of 8255 PPI and 8254 PIT.
8. Write a subroutine program to generate a square wave of 1KHz from the Counter-2 of 8254 PIT. Assume frequency of clock to be 10MHz.
9. Write 8086 ALP to take input from 8-switches connected to port A of 8255 PPI and display the status of the switches in 8 LEDs connected to port B of 8255 PPI. Assume the appropriate port address and draw the interfacing diagram.