Roll No. ..... Total Pages : 04

BT-5/D-18 35107

MICROPROCESSOR AND INTERFACING

ECE-301-N

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting *one* question from each Section.

Section I

1. (a) Explain the architecture of 8085 with the help of its internal block schematic. Write the flag register and explain each of the flags with an example. **8**

   (b) What is an addressing mode ? With suitable example, explain any *four* addressing modes in 8085 ? **7**

2. (a) Design decoding circuit to select 64 kB of memory divided into 8 modules. Use 74138 IC and mention address range for each module ? **8**

   (b) Explain how with external hardware TRAP can be masked ? What are different 8085 vectored interrupts ? Give the call locations for each interrupt. Explain each of them. **7**

Section II

3. (a) Draw the relevant pin diagram for 8086 Microprocessor and explain function of each pin in detail. **8**

   (b) Draw and explain the timing diagram for RD operation of 8086 microprocessor in Minimum Mode. **7**

4. (a) Interface eight 8K chips of RAM and four 8K chips of EPROM with 8086. Interface the RAM bank at a segment address 0B00H and the EPROM bank at a physical address F8000H. Do not allow any fold back space ? **10**

   (b) Explain the concept of memory banks in 8086 microprocessor. **5**

Section III

5. (a) Discuss the utility of XLAT instruction. Write an 8086 assembly language program to convert ASCII code to BCD code. **8**

   (b) Write an algorithm and assembly program to reverse the bits in a 16 bit number and check whether it is a palindrome. **7**

6. (a) Write down the addressing modes for the following instructions and calculate the physical address for the same making use of the given data Ax = 3000h, bx = 2000h, cx = 8000h, dx = 7000h, si = 6000h, bp = 4000h, sp = 4000h, di = f200h, cs = 5000h, ds = 8000h, es = 2000h, ss = 1000h, displacement = 0200h. 7

(i) Mov al, b1 (ii) Mov bx, [SP]

(iii) Mov BX, [1256] (iv) Mov DX, 200h

(v) Mov cx, disp [si] (vi) Mob bl, [bx] [di]

(vii) Mov bx, disp[bx][si]

(b) Generate the code for the following instructions using the template for MOV instruction. Generate alternate code also, if it exists. Also give the addressing mode for each of the instructions ? 8

(i) MOV DX, BX

(ii) MOV DS:1234H[BP], DH

(iii) MOV Ax, [SI]

(iv) MOV Dx, [DI+20H]

Section IV

7. (a) Interface an 8-bit DAC with an 8086 CPU running at 8 MHz and write an assembly language program to generate a triangular waveform of period 1 ms with V_{max} 5V ? 10

(b) With the help of diagram explain operation of 8237 DMA controller. 5

8. (a) Interface the 8086 microprocessor to a 4×4 keyboard, draw the necessary block diagram in support and also draw a flow chart for the same ? 8

(b) Interface ADC 0808 with 8086 using 8255 ports. Use port B of 8255 for transferring digital data output of ADC to the CPU and Port C for control signals. Assume that an analog input is present at I/P4 of the ADC and a clock input of suitable frequency is available for ADC. Draw the schematic and write required ALP. 7

TOPPERWorld