

BT-5/D-24

45168

MICROPROCESSOR AND INTERFACING

ES-301A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Section. All questions carry equal marks.

Section I

1. (a) Create a schematic representation of the 8086 microprocessor's functional components and elaborate on the concept of Pipelining. 10
- (b) Explain the concept of Memory Segmentation in detail. 5
2. (a) Illustrate the pin layout of the 8086 microprocessor and provide a detailed explanation of each pin's purpose. 10
- (b) Describe the role of the 8284 chip in generating timing and reset signals for the 8086 microprocessor. 5

Section II

3. (a) Provide and analyze the timing diagram for a memory read operation in the 8086 microprocessor's Minimum Mode. 10
- (b) Classify semiconductor memories. Describe the procedure of interfacing static memories with a CPU. 5
4. (a) Sketch and explain the interface of $8\text{ K} \times 8$ RAMs and $8\text{ K} \times 8$ E²PROM using a decoder in minimum mode. 10
- (b) Give the cell structures of PROM and E²PROM memories. 5

Section III

5. (a) Generate the HEX codes for the following instructions : 10
- (i) Mov AX, [SP+DI][2000]
- (ii) Mov AX, BX
- (b) Explain the following instructions with an example for each : 5
- (i) LDS
- (ii) XLAT
- (iii) AAA
- (iv) DAA
- (v) ROL.

6. (a) Define Addressing Modes and explain all the valid addressing modes for 8086 microprocessor. Explain the different assembler directives for 8086 microprocessor. 10
- (b) Write a 8086 ALP to convert a given hexadecimal number into its equivalent ASCII code. 5

Section IV

7. (a) Interface 8-bit ADC with 8086 using 8255 ports. Configure port A of 8255 for transferring output of ADC to the CPU and port C for control signals. Assume that an analog input is present at I/P2 of the ADC and a clock input of suitable frequency is available for ADC. Draw the schematic and write the required assembly language program. 8
- (b) Draw and explain the pin configuration and the internal architecture of 8255. Write a BSR mode control word subroutine to set bits PC7 and PC3 and reset them after 10 milli seconds. The port address selected is 83h. 7

8. (a) With the help of a block diagram, explain the functioning of Intel 8259 chip. 8
- (b) Explain in detail the functioning of 8237 DMA controller. 7

