(3 Hours) **[Total Marks: 80]**

N.B.: (1) Question No. 1 is **Compulsory**.
(2) Attempt any **three** questions out of the remaining **five**.
(3) Each question carries 20 marks and sub-question carry equal marks.
(4) Assume suitable data if required.

Q.1 Answer **any four:** [20 M]

a) Explain physical and logical address in 8086 processor.
b) Write an assembly language program using 8051 to swap two numbers.
c) Draw the Architecture of 8086.
d) Explain Memory organization of 8051 microcontroller.
e) Compare minimum mode and maximum mode of the 8086.

Q.2 a) List features of 8086 microprocessor and explain pipelining in detail. [10 M]

b) Explain operating modes of 8255 PPI. [10 M]

Q.3 a) Explain addressing modes of 8051. [10 M]

b) Explains string instructions of 8086 with examples. [10 M]

Q. 4 a) Design 8086 microprocessor based system using minimum mode with following specifications: i) 8086 microprocessor working at 10 MHz. ii) 128 KB EPROM using 32 KB chips iii) 64 KB SRAM using 16 KB Chip. [10 M]

b) Write a 8086 assembly language program to find the number of positive and negative numbers among a series of 10 signed numbers. [10 M]

Q. 5 a) Explain the block diagram of 8259 PIC. [10 M]

b) Explain the timer modes of 8051. [10 M]

Q. 6 Write short note on **(Any 3)** [20 M]

1. 8284 clock generator
2. Interfacing of a DC motor to microcontroller.
3. Interrupts of 8086.
4. Interfacing of keyboard to 8051

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