MODULE 1

Part A

1. List features of 8085 microprocessor.
2. The value of Code Segment (CS) Register is 3054H and the value of different registers is as follows: BX: 4025H, IP: 1580H, Dl:5467H.
3. What is pipelined architecture? How is it implemented in 8086?
4. Compare the architectural and signal difference between 8086 and 8088.
5. Differentiate between 8085 and 8086.
6. Differentiate between minimum mode and maximum mode in 8086.
7. What is the importance of Bus High Enable signal of 8086?
8. What is the use of ALE signal in 8086.
9. List the features of 8086.

Part B

1. Draw and discuss the internal block diagram of 8086.
2. With a neat sketch explain the read and write cycle timing diagram of 8086 in minimum mode.
3. Draw the structure of 8086 flag register and mention the purpose of each flag.
4. Explain the physical memory organization of 8086.
5. Draw and discuss the internal block diagram of 8085.

MODULE 2

Part A

1. State the significance of assembler directives in assembly language program and provide two examples for it.
2. List the 8086 instructions used for transferring data between registers, memory, stack and I/O devices.
3. Write any three-addressing mode of 8086 with example and write the effective address calculation in each.
4. Write the functions performed by PUSH and POP instructions in 8086 with appropriate diagram.
5. Explain one method for resetting the TRAP flag of 8086.

Part B

1. Discuss addressing modes supported by 8086 with suitable examples.
2. Discuss about the data transfer instructions with examples.
3. Assume that 8086 registers having values AX=0030H, BX= 003IH, CX:0032H, DX:0033h, Flag - 0000H.
   Predict the values of Registers and Flags I AX, BX, CX, DX, Carry flag (CF), Zero Flag (ZF), Sign Flag (SF) I after the execution of following instructions: (Assume each instruction are being executed independently)
   i) ROR AX,04h   ii) CMP BX, CX   iii) XCHG CX, DX   iv) AND AX, BX
   v) LOOP Addr   vi) XOR AX, AX   vii) STC
   Hint - Draw a table with columns Instructions AX, BX, CX, DX, CF, ZF,,SF and filI the answers

4. Write an 8086-program to find the largest among 'n' numbers (each number and count are of one byte only). Kindly assume that the size of array(count) stored in 2000h, and the numbers (array) stored from 2001h onwards up to 'n' continues locations.
5. Write an assembly language program to find the largest and smallest number from an unordered array of 16-bit numbers. Assume the array contains 15 numbers and the starting location as 2500H. Draw the flowchart for the program.
6. Write an assembly language program to find the total number of even and odd numbers from an array of 16-bit numbers. Assume the array contains 20 numbers and the starting location as 5500H. Draw the flowchart for the program.

MODULE 3

Part A

1. What is an interrupt vector table? Explain its structure in 8086.
2. Write notes on the following based on 8086:
   a. software interrupt
   b. hardware interrupt
   c. nested interrupt
3. Explain how the INT n instruction finds the starting address of its interrupt service routine in IVT.
4. Classify various categories of interrupts available in 8086.
5. Explain how 8086 computes the starting address of the ISR when it executes the instruction INT 21H.
6. Write short notes about the two hardware interrupt signals available in 8086.
7. Discuss the predefined interrupts in 8086.

Part B

1. Explain the stack structure of 8086.
2. Draw and explain the internal architecture of 8259.
3. State the purpose of Interrupt Vector Table of 8086 and explain its structure.
4. Explain the interrupt cycle of 8086.
5. Differentiate maskable and non-maskable interrupts in 8086.
6. Draw the architectural block diagram of 8259A and explain the function of each block.

MODULE 4

Part A

1. Determine the value to be loaded in control word register of 8255 if it has to be interfaced with 8086 in such a way that ports A & B are to be configured as input ports and port C is to be configured as output port? All ports are assumed to be in mode 0.
2. Write the function of the following control signals in 8255.
   RD, WR, A0, A1, RESET, CS
3. Draw and explain the operational waveform of 8254 in MODE 0 operation.
4. Interpret the mode and configurations of 8255 after its control word register is loaded with 86H.
5. Explain the features of 8257 DMA controller.

Part B

1. Explain the 8254 programmable timer and its operation modes with a neat block diagram
2. Explain different modes of operation of 8255 PPL
3. With a neat diagram describe the architecture of 8255 PPI
4. Give the registers available in 8257 DMA Controller. Explain their functions.
5. Explain the architecture of 8254 in detail.
6. Draw and explain the internal architecture of 8257.
7. What is the need of 8254 chip? Explain any two modes of operation of 8254.

MODULE 5

Part A

1. Draw and explain the format of program status word in 8051.
2. Differentiate between Microprocessors and Microcontrollers.
3. List the IO ports available in 8051
4. Explain the functions of the following components of 8051 microcontroller:
   (i) Processor Status Word   (ii) DPTR
5. Write short note on interrupt structure of 8051 microcontroller

6. What will be the effect of execution of each of the following 8051 instructions
   if register A contains the value 89H?

   (i) CPL A   (ii) RL A   (iii) SWAP A
7. Classify the following 8051 registers into bit-addressable or byte addressable groups:
   Registers are *A, P0, P1, SP*
8. How do the stack operations of 8051 differ from that of 8086?

Part B

1. What is meant by addressing mode of an instruction? Discuss about any three addressing modes supported by 8051 microcontrollers.
2. Explain the interrupt and stack structure of 8051.
3. Explain the addressing modes of 8051 with example.
4. Write an assembly language program for 8051 to find the transpose of a 2x2 matrix.
5. Explain the Internal RAM organization of 8051 with neat diagram.
6. Explain internal architecture of 8051 with neat diagram.
7. State the name and purpose of any 6 special function registers (SFRs) of 8051 microcontroller.