1. Add two numbers located at 3030H and 4040H. Display sum on Port 1. If carry is generated, display it on Port 2. Store sum on 5050H.
2. Write an Assembly Language Program that retrieves a data located at 2050H and it displays, if it is even and stores FFH on that location if it is odd.
3. Sixteen bytes of data are stored in memory location at 1050H to 105FH. Replace each data byte by FF.
4. Sixteen data are stored in memory location at 1050H to 105FH. Transfer the entire block of data to new location starting at 1070H.
5. Six bytes are stored in memory locations starting at 2050H. Add all the data bytes, save any carry generated while adding the data bytes. Display entire sum at two output ports and store total carry in 2070H and sum in 2071H.
6. If the content of memory location 2050H is greater than or equal to 64H, display 0FH else display FFH.
7. We have a list of data stored at memory location starting at 2050H. The end of the data array is indicated by data byte 00H. Add the set of readings. Display the sum at Port 1 and total carry at Port 2.
8. For ten bytes data starting from 1120H, write a program to sort the reading in ascending and in descending order.
9. A set of six data bytes is stored starting from memory location 2050H. The set includes some blank spaces (bytes with zero values). WAP to eliminate the blanks from the block.
10. WAP to read BCD number stored at memory location 2020H and converts it into binary equivalent and finally stores that binary pattern into memory location 2030H.
11. A multiplicand is stored in memory location 1150H and a multiplier is stored in location 1151H. WAP to multiply these numbers and store result from 1160H.
12. A dividend is stored in memory location 2020H and a divisor is stored in 2021H. WAP to divide these numbers and store quotient and remainder from 2040H.
13. Write a program for 8085 to change the bit D5 of ten numbers stored at address 7600H if the numbers are larger than or equal to 80H.
14. Write a program for 8085 to find the smallest number among ten numbers stored at memory location 4500H.
15. **Draw the timing diagram and Register Transfer language for:**
    1. MOV A, B
    2. MOV A, M
    3. MOV M, A
    4. MVI B, 40H
    5. MVI M, 20H
    6. LXI B, 4500H
    7. SHLD 4500H

8. LHLD 4500H
9. STAX B
10. LDAX B
11. Any one: ADD B/ SUB B / ADC B / SBB B
12. Any one: ADD M/ SUB M
13. Any one: ADI 54H/ SUI 54H
14. Any one: RAL/RAR/RLC/RRC
15. Any one: INR B/ DCR C
16. Any one: INR M/ DCR M
17. Any one: INX B/ DCX B
18. Any one: ORA B/ ANA B, XRA B
19. Any one: ORA M/ ANA M, XRA M
20. Any one: ORI 20H/ ANI 20H, XRI 20H

Subjective questions:

1. Differentiate between von Neumann and Harvard architecture/microprocessor and microcontroller along with their applications.
2. What is modified Harvard Architecture? Explain Fetch Decode and execute cycle in detail
3. Explain the block diagram of 8085/8086/80386 microprocessor(flags,register set)
4. Explain the block diagram of IO interfaces
   a. 8251 serial interface
   b. 8255A parallel interface
   c. 8259 PIC
   d. 8237 DMA(working procedure)

   Also prepare the interfacing of above IO interface with 8085 microprocessor.
5. Explain the addressing modes associated with 8085/8086 microprocessor.
6. Draw the pin diagram of 8085 and 8086 MPU
7. Explain different assembler directives of 8086 microprocessor.
8. Explain the concept of memory segmentation and pipelining in 8086 MPU.
9. Explain assembling, linking and executing in ALP. Differentiate between one pass assembler and two pass assembler.
10. Explain different hardware and software pins associated with 8085 and 8086 microprocessor (interrupt vector table).
11. Explain vectored and non-vectored interrupt.
12. Explain different operating modes of 8255A PPI. Enlighten the concept of writing control word in BSR and IO mode.Suppose the control word is 72H in BSR mode and 93H in IO mode.What does it signify?
13. Differentiate between IO mapped IO and memory mapped IO.

14. Explain synchronous and asynchronous bus in serial communication.Explain different modes of data transfer in parallel communication(simple IO, strobe IO,single handshaking,double handshaking).
15. Explain null modem connection(how can two computers be connected with each other using RS 232 connection)
16. Write short notes on:
    a. RS 232
    b. RS 422
    c. RS 423
    d. Use of BYSYNC protocol
    e. SIM and RIM instruction
17. Design an address decoding circuit to interface RAM chip and a ROM chip of 256 bytes each at address 5300H.
18. Present a complete plan to use 2 RAM chips of 16 KB each with 8085 microprocessor.
19. Design an address decoding circuit to interface two RAM chips each of 64 bytes at address 4C00H.
20. Design an address decoding circuit to interface 5 RAM chips of 2048 bytes each at base address 5600H

8086 ALP:

1. . Write an ALP to find factorial of number for 8086.
2. The 8 data bytes are stored from memory location E000H to E007H. Write 8086 ALP to transfer the block of data to new location B001H to B008H.
3. Write a program to display string “Computer Engineering” for 8086.
4. Write a program to reverse the given string for 8086.
5. Write a program to multiply 2 numbers (16-bit data) for 8086.
6. Find number of times letter “e” exist in the string “engineering”, Store the count at memory.
7. Write an assembly language program to count number of vowels in a given string.
8. Write an assembly language program to convert upper case into lower case.