ASSIGNMENTS

1. List the four categories of 8085 instructions that manipulate data.
2. Define opcode and operand, and specify the opcode and the operand in the instruction MOV H,L.
3. Write the machine code for the instruction MOV H,A if the opcode = 01_2, the register code for H = 100_2, and the register code for A = 111_2.
4. Find the machine codes and the number of bytes of the following instructions. Identify the opcodes and the operands. (Refer to the instruction set on the inside back cover.)
   a. MVI H,47H **b.** ADI F5H **c.** SUB C
5. Find the Hex codes for the following instructions, identify the opcodes and operands, and show the order of entering the codes in memory.
   a. STA 2050H **b.** JNZ 2070H
6. Find the Hex machine code for the following instructions from the instruction set listed on the back cover, and identify the number of bytes of each instruction.

```
MVI B,4FH     ;Load the first byte
MVI C,78H     ;Load the second byte
MOV A,C       ;Get ready for addition
ADD B         ;Add two bytes
OUT 07H       ;Display the result at port 7
HLT           ;End of program
```

7. If the starting address of the system memory is 2000H, and you were to enter the Hex code for the instructions in Question 6, identify the memory addresses and their corresponding Hex codes.
8. Assemble the following program, starting with the memory address 2020H.

```
MVI A,8FH     ;Load the first byte
MVI B,68H     ;Load the second byte
SUB B         ;Subtract the second byte
ANI 0FH       ;Eliminate D7–D4
STA 2070H     ;Store D3–D0 in memory location 2070H
HLT           ;End of program
```

9. Assemble the following program, starting at location 2000H.

```
START: IN F2H     ;Read input switches at port F2H
       CMA        ;Set ON switches to logic 1
       ORA A      ;Set Z flag if no switch is ON
       JZ START   ;Go back and read input port if all
                  ;  switches are off
```

10. Write logical steps to add the following two Hex numbers. Both the numbers should be saved for future use. Save the sum in the accumulator.

Numbers: A2H and 18H

11. Translate the program in Question 10 into the 8085 assembly language.

12. Data byte 28H is stored in register B and data byte 97H is stored in the accumulator. Show the contents of registers B, C, and the accumulator after the execution of the following two instructions:

```
MOV A,B
MOV C,A
```

13. In Question 6, explain the potential results of the program if the code 07H of the out instruction is omitted.

14. In Question 8, explain possible outcomes if the second byte 0FH of the instruction ANI 0FH is omitted.

15. Given the following three sets of Hex codes, identify the mnemonics:

(a)	(b)	(c)
3E	06	06
F2	82	4F
32	78	0E
32	32	37
20	50	78
76	20	81
	FF	00
		32
		35
		20
		76

16. Identify and explain the results of Question 15 (a) and (b).

17. In Question 15 (c), what does the code 00 represent: data, low-order address, or an opcode?

18. In Question 15 (c), explain what the program does, calculate the sum, and identify the memory location where the sum is stored.