Lecture –10

1. **Write an ALP to load register B with data 14H, register C with FFH, register D with 29H and register E with 67H.**

   MVI B, 14H

   MVI C, FFH

   MVI D, 29H

   MVI E, 67H

   HLT

2. **Write an ALP to transfer data from register B to C.**

   MVI B, 55H

   MOV C, B

   HLT

3. **Write an ALP to store data of register B into memory location 2050H.**

   MVI B, 67H

   MOV A, B

   STA 2050H; Store data of Accumulator at memory location 2050H

   HLT

4. **Write an ALP which directly store data 56H into memory location 2050H.**

   LXI H, 2050H

   MVI M, 56H

   HLT

5. **Write an 8085 assembly language program for exchanging two 8-bit numbers stored in memory locations 2050h and 2051h.**

   LDA 2050H

   MOV B, A

   LDA 2051H

   STA 2050H

   MOV A, B

   STA 2051H

   HLT

6. **Write an ALP to interchange 16-bit data stored in register BC and DE.**

   WITHOUT XCHG INSTRUCTION

   MOV H, B

MOV L, C

MOV B, D

MOV C, E

MOV D, H

MOV E, L

HLT

WITH XCHG INSTRUCTION
MOV H, B

MOV L, C

XCHG   ; The contents of register H are exchanged with the contents of register D, and the

            ; Contents of register L are exchanged with the contents of register E.

MOV B, H

MOV C, L

HLT

7. **Write the set of 8085 assembly language instructions to store the contents of B and C registers on the stack.**
MVI B, 50H

MVI C, 60H

PUSH B

PUSH C

HLT

8. **Write an ALP to delete (Make 00H) the data byte stored at memory location from address stores in register DE.**
MVI A, 00H

STAX D

HLT

9. **Write an 8085 assembly language program to add two 8-bit numbers stored in memory locations 2050h and 2051h. Store result in location 2052h.**
LXI H 2050H

MOV A, M

INX H

ADD M

INX H

MOV M A

HLT

10. Subtract 8 bit data stored at memory location 2050H from data stored at memory location 2051H and store result at 2052H.

LXI H 2050H

MOV A, M

INX H

SUB M

INX H

MOV M A

HLT

11. Write an 8085 assembly language program to add two 16-bit numbers stored in memory.

LHLD 2050H

XCHG   ; the contents of register H are exchanged with the contents of register D, and the

            ; contents of register L are exchanged with the contents of register E.

LHLD 2052H

MOV A E

ADD L

MOV L A

MOV A D

ADC H

MOV H A

SHLD 2054H; Store Value of L Register at 2054 and value of H register at 2055.

HLT

12. Write an 8085 assembly language program to find the number of 1's binary representation of given 8-bit number.

MVI B 00H

MVI C 08H

MOV A D

BACK: RAR ; Rotate Accumulator Right through carry flag.

JNC SKIP

INR B

SKIP: DCR C ; Increment of B will skip.

JNZ BACK

HLT

13. Implement the Boolean equation D= (B+C) · E, where B, C, D and E represents data in various registers of 8085.

MOV A B

ORA C

ANA E

MOV D A

HLT

14. Write an 8085 assembly language program to add two decimal numbers using DAA instruction.

LXI H 2050H

MOV A M

INX H

MOV B M

MVI C 00H

ADD B

DAA ; Decimal adjustment of accumulator.

JNC SKIP

INR C

SKIP: INX H ; Increment of C will skip.

MOV M A

INX H

MOV M C

HLT

15. **Write an 8085 assembly language program to find the minimum from two 8-bit numbers.**

```
LDA 2050H

MOV B A

LDA 2051H

CMP B

JNC SMALL

STA 2052H

HLT

SMALL: MOV A B

STA 2052H

HLT
```

16. **Write an 8085 program to copy block of five numbers starting from location 2001h to locations starting from 3001h.**

```
LXI D 3100H

MVI C 05H

LXI H 2100

LOOP: MOV A M

STAX D

INX  D

INX  H

DCR C

JNZ LOOP

HLT
```

17. **An array of ten data bytes is stored on memory locations 2100H onwards. Write an 8085 assembly language program to find the largest number and store it on memory location 2200H.**

```
LXI H 2100H

MVI C 0AH

MOV A M

DCR C

LOOP: INX H
```

CMP M   ; Compare Data of accumulator with the data of memory location specified by HL pair and

               ; set flags accordingly.

JNC AHED

MOV A M

AHED: DCR C

JNZ LOOP

STA 2200H

HLT

18.   Write an 8085 assembly language program to add block of 8-bit numbers.

LXI H 2000H

LXI B 3000H

LXI D 4000H

BACK: LDAX B

ADD M

STAX D

INX H

INX B

INX D

MOV A L

CPI 0A

JNZ BACK

HLT

19.   Write an 8085 assembly language program to count the length of string ended with 0dh starting from location 2050h (Store length in register B).

LXI H 2050H

MVI B 00H

BACK: MOV A M

INR B

INX H

CPI 0DH

```
JNZ BACK

DCR B

HLT
```

20. **An array of ten numbers is stored from memory location 2000H onwards. Write an 8085 assembly language program to separate out and store the EVEN and ODD numbers on new arrays from 2100H and 2200H, respectively.**

```
LXI H 2000H

LXI D 2100H

LXI B 2200H

MVI A 0AH

COUNTER: STA 3000H

MOV A M

ANI 01H

JNZ CARRY

MOV A M

STAX B

INX B

JMP JUMP

CARRY: MOV A M ; This block will store Odd numbers.

STAX D

INX D

JUMP: LDA 3000H

DCR A

INX H

JNZ COUNTER

HLT
```

21. **An array of ten data bytes is stored on memory locations 2100H onwards. Write an 8085 assembly language program to find the bytes having complemented nibbles (e.g. 2DH, 3CH, 78H etc.) and store them on a new array starting from memory locations 2200H onwards.**

```
LXI H 2100H

LXI D 2200H
```

```
MVI C 0AH

LOOP: MOV A M

ANI 0FH

MOV B A

MOV A M

ANI F0H

RRC

RRC

RRC

RRC

CPM B

JNZ NEXT

MOV A M

STAX D

INX D

NEXT: INX H

DCR C

JNZ LOOP

HLT
```

22. **Write an 8085 assembly language program to count the positive numbers, negative numbers, zeros, and to find the maximum number from an array of twenty bytes stored on memory locations 2000H onwards. Store these three counts and the maximum number on memory locations 3001H to 3004H, respectively.**

```
LXI H 2000

MVI C 14

MVI D 00

MVI B 00

MVI E 00

LOOP: MOV A M

CMP B
```

```
JC NEG

JNZ POS

INX H

DCR C

JNZ LOOP

JMP STORE


NEG: INR D ; Count Negative number

INX H

DCR C

JNZ LOOP

JMP STORE


POS: INR E ; Count Positive number

INX H

DCR C

JNZ LOOP

JMP STORE


STORE: MOV A E

STA 3001


MOV A D

STA 3002


LXI H 2000

MVI C 14

MVI D 00

MVI B 00
```

```
MVI E 00

LOOP1: MOV A M ; Main Program for count Zero And Find Maximum.

CMP B

JZ ZERO

JNC MAX

INX H

DCR C

JNZ LOOP1

JMP STORE1


ZERO: INR D ; For count Zero

INX H

DCR C

JNZ LOOP1

JMP STORE1


MAX: CMP E ; Find Maximum.

JC SKIP

MOV E A

SKIP: INX H

DCR C

JNZ LOOP1

JMP STORE1


STORE1: MOV A D ; Store Number of zeros

STA 3003

MOV A E

STA 3004 ; Store maximum.
```

HLT

23. Write an 8085 assembly language program to separate out the numbers between 20_{10} and 40_{10} from an array of ten numbers stored on memory locations 2000H onwards. Store the separated numbers on a new array from 3000H onwards.

```
LXI H 2000

LXI D 3000

MVI C 0A

LOOP: MOV A M

CPI 14

JZ NEXT

JC NEXT

CPI 28

JNC NEXT

STAX D

INX D

NEXT: INX H ; Skip Storing of Number.

DCR C

JNZ LOOP

HLT
```

24. Write an 8085 assembly language program sort an array of twenty bytes stored on memory locations 2000H onwards in descending order.

```
MVI B 14

L2: LXI H 2000

MVI C 13

L1: MOV A M

INX H

CMP M

JC SWAP

bACK: DCR C

JNZ L1
```

DCR B

JNZ L2

HLT

SWAP: MOV D M; This block swap values.

MOV M A

DCX H

MOV M D

INX H

JMP BACK

25. An array of twenty data bytes is stored on memory locations 4100H onwards. Write an 8085 assembly language program to remove the duplicate entries from the array and store the compressed array on a new array starting from memory locations 4200H onwards.

MVI B 14H

MVI C 01H

LXI H 4101H

SHLD 3000H

LDA 4100H

STA 4200H

; This program fetch one by one value from original array and sore it on new array if it is not duplicate.

L1: LHLD 3000H

MOV A M

INX H

DCR B

JZ OVER

SHLD 3000H

LXI H 4200H

MOV D C

L2: CMP M

JZ L1

INX H

DCR D

JNZ L2

MOV M A

INR C

JMP L1

OVER: HLT

26. Write an ALP to Pack the two unpacked BCD numbers stored in memory locations 2200H and 2201H and store result in memory location 2300H. Assume the least significant digit is stored at 2200H.

LDA 2201

RLC ; Rotate accumulator left 4 times without carry.

RLC

RLC

RLC

ANI F0

MOV C A

LDA 2200

ADD C

STA 2300

HLT

27. Write a set of 8085 assembly language instructions to unpack the upper nibble of a BCD number.

MVI A 98

MOV B A

ANI F0

RRC ; Rotate accumulator left 4 times without carry.

RRC

RRC

RRC

STA 2000

HLT

28. Write Assembly language program to subtract 2 16-bit BCD numbers.

LXI H 3040

LXI D 1020 MOV A L

SUB E DAA

STA 2000 MOV A H

SBB D DAA

STA 2001 HLT