Logical Operations

- **AND, OR, Exclusive-OR:** Any 8-bit data, or the contents of a register, or the contents of a memory location can be logically ANDed, ORed or Exclusive-ORed with the contents of accumulator. Result is stored in accumulator.
- **Rotate:** Each bit in the accumulator can be shifted either left or right to the next position.
- **Compare:** Any 8-bit data, or the contents of a register, or the contents of a memory location can be compared for equality, greater than, or less than, with the contents of accumulator.
- **Complement:** The contents of the accumulator can be complemented:all 0s are replaced by 1s and all 1s are replaced by 0s.

ANA/ORA/XRA R/M : Logically AND/OR/Exclusive-OR the contents of register/memory location with the content of accumulator.

If second operand is a memory location then it is addressed by HL pair register.

. Result is stored in accumulator.

Opcode	Operand	Byte	M- Cycle	T-State
ANA/ORA/XRA	R	1	1	4
ANA/ORA/XRA	M	1	2	7

- **AND:S,Z and P flags are modified. CY is reset.AC is set.**
- **OR:S,Z and P flags are modified. CY and AC is reset.**
- **XOR:S,Z and P flags are modified. CY and AC is reset.**

ANI/ORI/XRI 8-bit data : Logically AND/OR/Exclusive-OR 8-bit data with the content of accumulator.

. Result is stored in accumulator.

Opcode	Operand	Byte	M- Cycle	T-State
ANI/ORI/XRI	8 bit data	2	2	7

- **AND:S,Z and P flags are modified. CY is reset.AC is set.**
- **OR:S,Z and P flags are modified. CY and AC is reset.**
- **XOR:S,Z and P flags are modified. CY and AC is reset.**

CMA : Complement the contents of the accumulator.

Opcode	Operand	Byte	M- Cycle	T-State
CMA	None	1	1	4

- **No flags are affected.**

CMC : Complement the carry flag.

Opcode	Operand	Byte	M- Cycle	T-State
CMC	None	1	1	4

- **Only carry flag is modified.**

CMP R/M : Compare the contents of register/memory location with the contents of accumulator.

Both contents are preserved.

Opcode	Operand	Byte	M- Cycle	T-State
CMP	R	1	1	4
CMP	M	1	2	7

CPI 8-bit data : Compare the 8-bit data with the contents of accumulator.

Opcode	Operand	Byte	M- Cycle	T-State
CPI	8-bit data	2	2	7

- **If (A)<(R/M/8-bit data): CY is set and ZF is reset.**
- **If (A)=(R/M/8-bit data): ZF is set and CY is reset.**
- **If (A)>(R/M/8-bit data): CY is reset and ZF is reset.**

RLC: Rotate each bit of accumulator to the left position.

Opcode	Operand	Byte	M- Cycle	T-State
RLC	None	1	1	4

RAL: Rotate each bit of accumulator including the carry to the left position.

Opcode	Operand	Byte	M- Cycle	T-State
RAL	None	1	1	4

- **CY is modified according to bit D_7.**
- **S, Z, AC and P are not affected.**

RRC: Rotate each bit of accumulator to the right position.

Opcode	Operand	Byte	M- Cycle	T-State
RRC	None	1	1	4

RAR: Rotate each bit of accumulator including the carry to the right position.

Opcode	Operand	Byte	M- Cycle	T-State
RAR	None	1	1	4

- **CY is modified according to bit D_0.**
- **S, Z, AC and P are not affected.**