Program 8: Mask the higher nibble of an 8-bit number.

Flowchart:

```
                    ┌──────────────┐
                    │    Start     │
                    └──────┬───────┘
                           │
                    ┌──────▼───────────┐
                    │ Load accumulator │
                    │ with operand     │
                    │ from memory.     │
                    └──────┬───────────┘
                           │
                    ┌──────▼───────────┐
                    │ Perform AND      │
                    │ operation of     │
                    │ 0FH with         │
                    │ accumulator.     │
                    └──────┬───────────┘
                           │
                    ┌──────▼───────────┐
                    │ Store the result │
                    │ from accumulator │
                    │ to memory.       │
                    └──────┬───────────┘
                           │
                    ┌──────▼───────┐
                    │     Stop     │
                    └──────────────┘
```
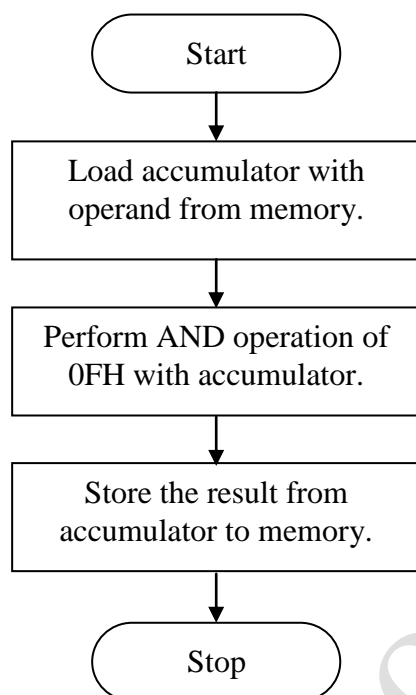
Program:

Address	Mnemonics	Operand	Opcode	Remarks
2000	LDA	3000H	3A	Load H-L pair with data from 3000H.
2001			00	Lower-order of 3000H.
2002			30	Higher-order of 3000H.
2003	ANI	0FH	E6	AND Immediate 0FH with reg. A.
2004			0F	Immediate value 0FH.
2005	STA	3001H	32	Store the result at memory location 3001H.
2006			01	Lower-order of 3001H.
2007			30	Higher-order of 3001H.
2008	HLT		76	Halt.

Explanation:

- This program masks the higher nibble of an 8-bit number stored in memory location 3000H.

- Let us assume that the operand stored at memory location 3000H is 45H.

- The operand is moved to accumulator from memory location 3000H.

- Then, AND operation of 0FH is performed with accumulator. This results in the masking of higher nibble.

- The result is stored at memory location 3001H.

Output:

Before Execution:

3000H: 45H

After Execution:

3001H: 05H