3.

a)

A	B	C	D	F3	F2	F1	F0		
0	0	0	0	d	d	d	d		
0	0	0	1	0	1	1	1	7	A1
0	0	1	0	1	0	0	1	9	A2
0	0	1	1	0	1	1	0	6	A3
0	1	0	0	0	0	1	0	2	A4
0	1	0	1	0	1	0	1	5	A5
0	1	1	0	1	0	0	0	8	B1
0	1	1	1	0	0	0	1	1	B2
1	0	0	0	0	0	1	1	3	B3
1	0	0	1	0	0	1	0	2	B4
1	0	1	0	1	0	0	1	9	B5
1	0	1	1	d	d	d	d	d	d
1	1	0	0	d	d	d	d	d	d
1	1	0	1	d	d	d	d	d	d
1	1	1	0	d	d	d	d	d	d
1	1	1	1	1	1	1	1	15	15

b)

F3

AB \ CD	00	01	11	10
00	d	0	0	1
01	0	0	0	1
11	d	d	1	d
10	0	0	d	1

F3= C.D' + A.B

F2

AB \ CD	00	01	11	10
00	d	1	1	0
01	0	1	0	0
11	d	d	1	d
10	0	0	d	0

F2=A'.B'.D+A'.C'.D+AB**=A'(B'.D+C'D)+A.B**

F1

CD \ AB	00	01	11	10
00	d	1	1	0
01	1	0	0	0
11	d	d	1	d
10	1	1	d	0

F1=C'.D'+B'D+AB

F0

CD \ AB	00	01	11	10
00	d	1	0	1
01	0	1	1	0
11	d	d	1	d
10	1	0	d	1

F0=D'.A + DB+AB+ C'D.A'+ D'A'B'=**A'(D'B'+C'D)+DB+AB+ D'.A**

A B C D

IC1
1 ▷ 2
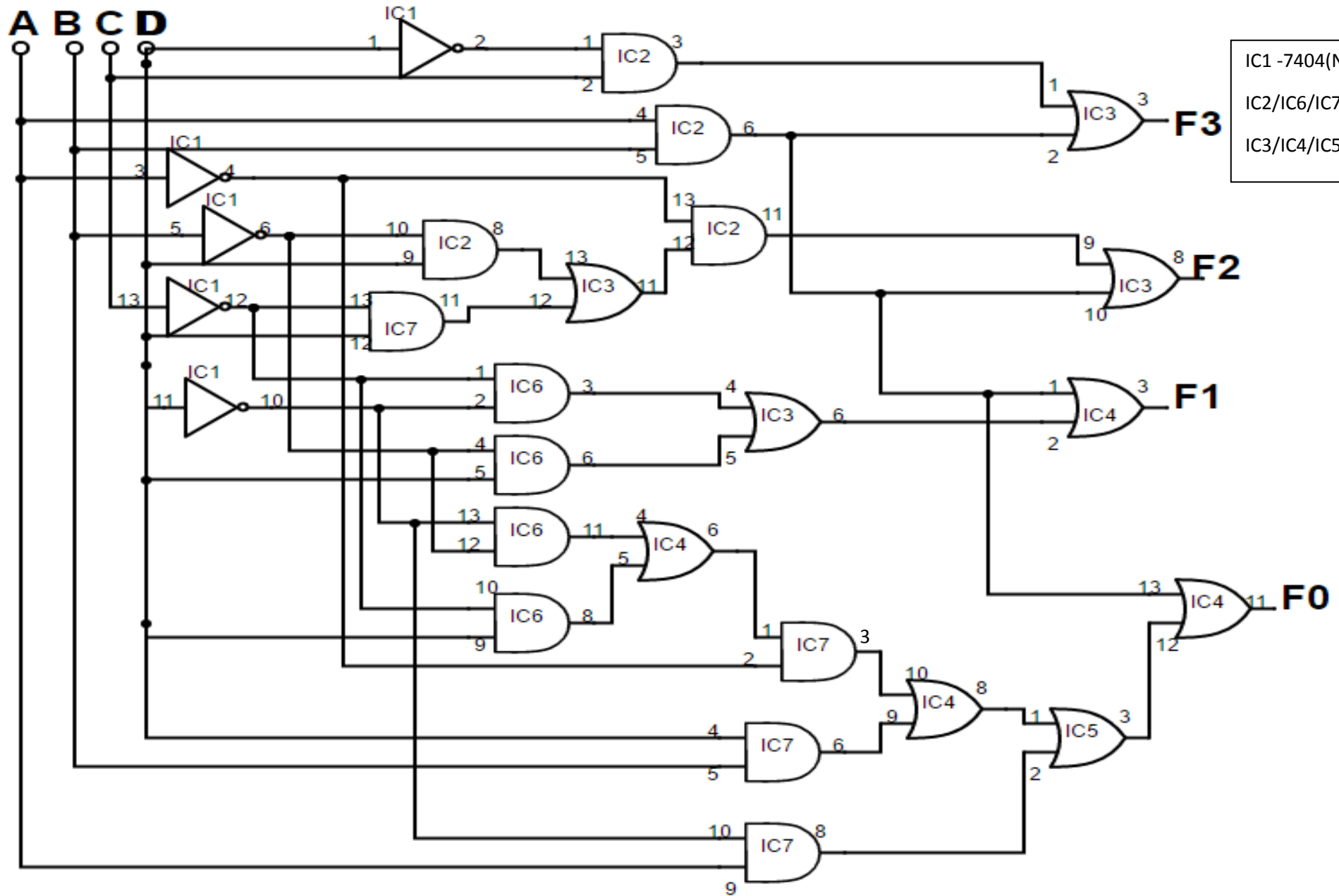
IC1 -7404(NOT)

IC2/IC6/IC7-7408(AND)

IC3/IC4/IC5-7432(OR)

IC2
1
3
2

IC3
1
3
2
F3

IC2
4
6
5

IC1
3 ▷ 4

IC1
5 ▷ 6

IC2
13
11
12

IC2
10
8
9

IC3
13
11
12

IC3
9
8
10
F2

IC7
13
11
12

IC1
13 ▷ 12

IC1
11 ▷ 10

IC6
1
3
2

IC3
4
6
5

IC4
1
3
2
F1

IC6
4
6
5

IC6
13
11
12

IC4
4
6
5

IC6
10
8
9

IC7
1
3
2

IC4
10
8
9

IC5
1
3
2

IC4
13
11
12
F0

IC7
4
6
5

IC7
10
8
9