1) With sequential circuits the output depends on the current input and the current state. In combinational circuits, the output depends only on the input. Therefore:

a) combinational
b) combinational
c) combinational
d) sequential
e) sequential
f) combinational

2a)

in3	In2	in1	in0	F4
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

2b) F4 = in1'•in0'

2c)The complexity is two inverters and one 2-input AND gate.

3a)

in3	in2	in1	in0	F4	F2	F8
0	0	0	0	1	1	1
0	0	0	1	0	0	0
0	0	1	0	0	1	0
0	0	1	1	0	0	0
0	1	0	0	1	1	0
0	1	0	1	0	0	0
0	1	1	0	0	1	0
0	1	1	1	0	0	0
1	0	0	0	1	1	1
1	0	0	1	0	0	0
1	0	1	0	0	1	0
1	0	1	1	0	0	0
1	1	0	0	1	1	0
1	1	0	1	0	0	0
1	1	1	0	0	1	0
1	1	1	1	0	0	0

F2 = in0'

The complexity is one inverter.

F8 = in2'•in1'•in0'

The complexity is three inverters and a 3- input AND gate.

3b) F4 = F2 • in1'

3c) F8 = F4 • in2'