

Logic design (2016 fall)

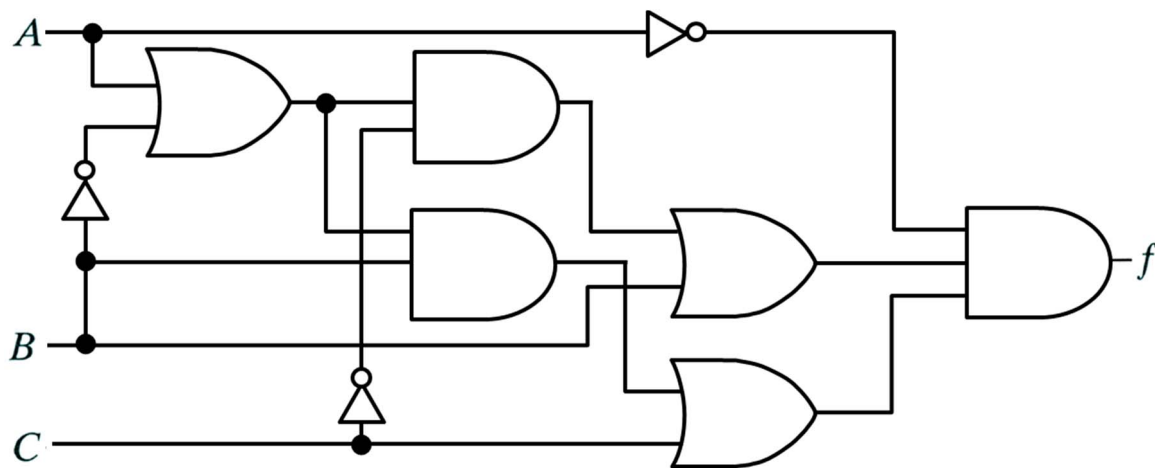
Quiz # 7

Name: _____ ID: _____

1. (50%) For the following circuit

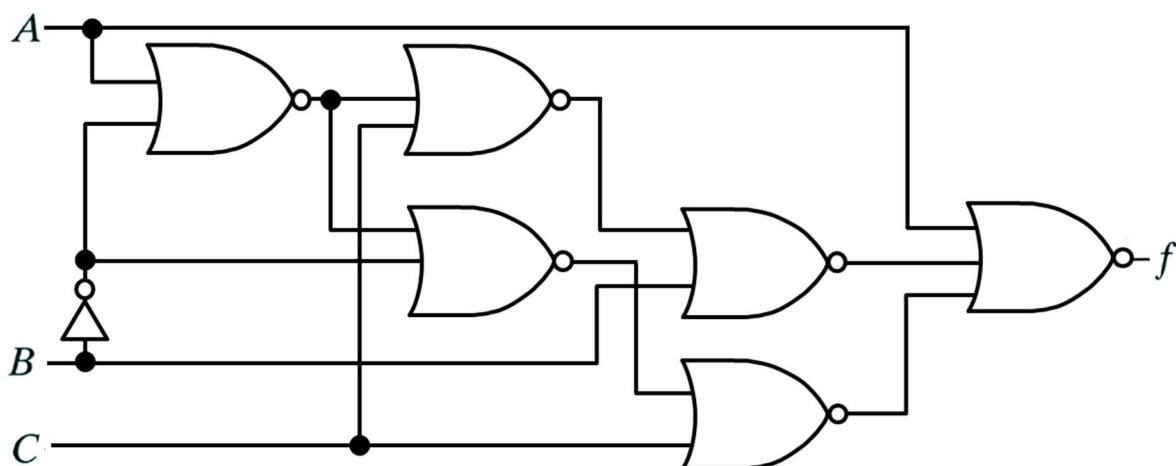
(a) (10%) What is the level of the circuit?

(b) (40%) Use gate-equivalences to convert the circuit into a circuit containing only NOR gates and **least** NOT gates. Note that the inputs must be in uncomplemented form.



Ans:

5



2. (50%) Given the Karnaugh Maps for f_1 and f_2 .

$$f_1$$

$ab \backslash cd$	00	01	11	10
00	1	X	0	1
01	1	0	X	1
11	0	X	0	1
10	0	1	0	X

$$f_2$$

$ab \backslash cd$	00	01	11	10
00	X	1	X	X
01	0	0	1	X
11	0	X	0	1
10	X	X	0	1

Draw a minimum two-level, multiple-output AND-OR circuit to realize f_1 and f_2 (using minimum number of gates and minimum number of gate inputs). Note that the inputs can be in complemented form.

$$f_1 = ab' + b'c' + a'bd'$$

$$f_2 = ab' + ac' + a'bd'$$

