Information Technology University of the Punjab
SE201 Digital Logic Design – Fall 2024
Quiz 7

Name: _____ **Roll No.: _____**
Time allowed: 10 minutes
Maximum Marks: 10

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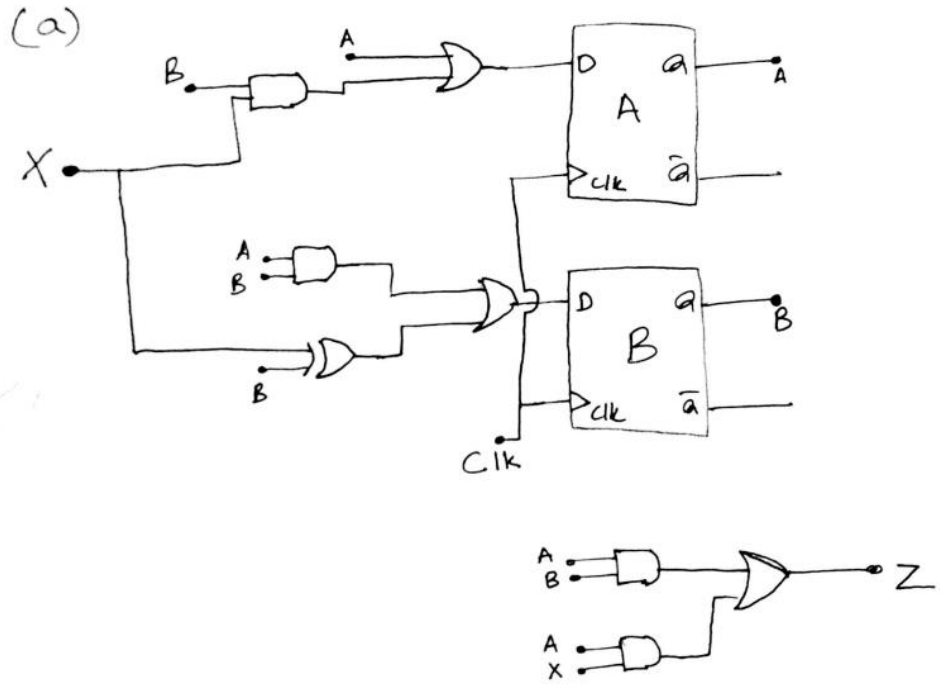
1. A sequential circuit with two D flip-flops A and B, one input X, and one output Z is specified by the following input equations:

$D_A = A + BX$

$D_B = (B \oplus X) + AB$

$Z = AB + AX$

(a) Draw the logic diagram of the circuit. [3]



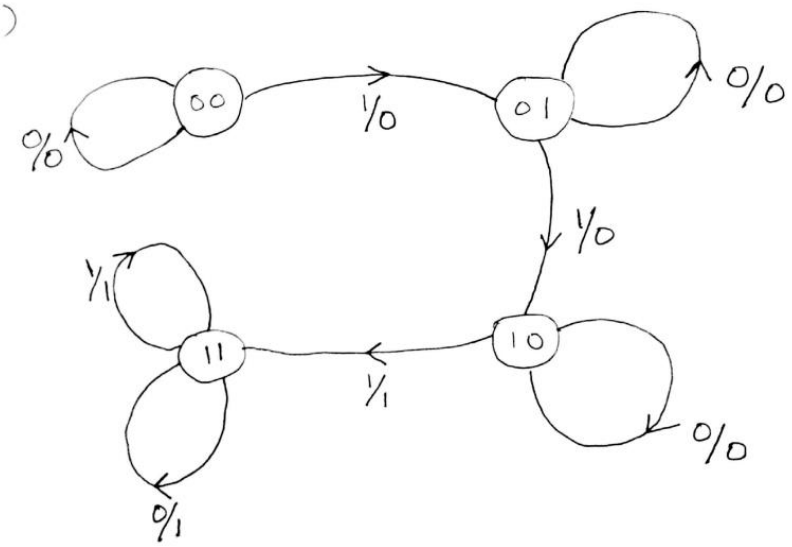
(b) Derive the state table. [3]

(b)

A	B	X	A^+	B^+	Z
0	0	0	0	0	0
0	0	1	0	1	0
0	1	0	0	1	0
0	1	1	1	0	0
1	0	0	1	0	0
1	0	1	1	1	1
1	1	0	1	1	1
1	1	1	1	1	1

(c) Draw the state diagram. [3]

(c)



(d) Briefly describe the functionality of the circuit in your own words. [1]

(d) This is a saturating 2-bit counter. It counts up when the input is high. The output is high when it reaches the saturation.