Logic design (2018 fall)
Quiz # 15

Name:_____ID:_____

1. (100%) The state tables for two sequential circuits N_1 and N_2 are shown below.
   (a) (60%) Use the implication table shown in Table_1 to prove whether N_1 and N_2 are equivalent.
   (b) (20%) Which states in circuit N_1 are equivalent?
   (c) (20%) Which states in circuit N_2 are equivalent?

Circuit N_1

Present State	Next State X = 0	Next State X = 1	Output
S_0	S_4	S_0	1
S_1	S_5	S_1	1
S_2	S_4	S_3	0
S_3	S_4	S_2	0
S_4	S_1	S_3	0
S_5	S_1	S_2	0

Circuit N_2

Present State	Next State X = 0	Next State X = 1	Output
A	D	B	0
B	A	B	0
C	A	C	1
D	A	D	1

Table_1

(a)
N1 ≡ N2
S0 ≡ S1 ≡ C ≡ D
S2 ≡ S3 ≡ B
S4 ≡ S5 ≡ A

(b)
S0 ≡ S1
S2 ≡ S3
S4 ≡ S5

(c)
C ≡ D