## CS 240 Gates [50 points]

## Your ID Number:

Time spent on Q1: \_\_\_\_\_

About how many total hours did you spend actively working on this assignment? \_\_\_\_\_

Q1	[4	po	in	ts1

F1 =

F2 =

Α	В	С	F1	F2
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

Q2 [6 points]	Time spent on Q2:

Draw your three circuits here:

	l Equi	valent		Counterexamp	ole or expla	nation:	Time spent on Q3:	
	•			Counterexamp	ole or expla	nation:		
	-			Counterexample or explanation:				
	Equi	valent		Counterexamp	ole or expla	nation:		
			rts a [2]	I and c [2]			Time spent on Q4:	
Α	В	AB	A'B'	AB + A'B'	bexp <sub>4b</sub>	AB + bexp <sub>4b</sub>		
0	0							
0	1						-	
1	0							
							-	
Below, show steps in deriving the answer expressions  b [1] bexp <sub>4b</sub> =								
[2]	bexp	<sub>4d</sub> =						
[3 <i>ii</i>	ndepe	enden	ot] bex	p <sub>4e</sub> =				
	[Inc	Equir   Not 6	□ Equivalent □ Not equiva □ Hable for pa A B AB □ □ □ □ Hable for pa A B AB □ □ □ □ □ Hable for pa □ Hable	□ Equivalent □ Not equivalent □ Equivalent □ Not equivalent □ Not equivalent □ Harris a [2]  A B AB AB AB  CONTROL  AB AB AB  CONTROL  CONTROL  AB AB AB  CONTROL  C	Counterexamp    Equivalent   Counterexamp   Equivalent   Counterexamp   Equivalent   Counterexamp   Equivalent   Counterexamp   Equivalent   Counterexamp   Equivalent   Counterexamp   Equivalent   Counterexamp   Equivalent   Counterexamp   Equivalent   AB   AB   A'B'   AB + A'B'     AB   AB   A'B'   AB + A'B'	Counterexample or expla	Counterexample or explanation:    Equivalent	

Q5 [5 points]	Time spent on Q5:	Q6 [5 points]	Time spent on Q6:
a [2] bexp₅ =	_	a [2 independent] bex	
			•
b [3] circuit diagram:		b [3 independent] circ	uit diagram:
O7 [8 points]			Time spent on O7:
Q7 [8 points]			Time spent on Q7:
	ms of 2-input NAND gates.		Time spent on Q7:
	ms of 2-input NAND gates.		Time spent on Q7:
	ms of 2-input NAND gates.		Time spent on Q7:
	ms of 2-input NAND gates.		Time spent on Q7:
	ms of 2-input NAND gates.		Time spent on Q7:
	ms of 2-input NAND gates.		Time spent on Q7:
	ms of 2-input NAND gates.		Time spent on Q7:
	ms of 2-input NAND gates.		Time spent on Q7:
	ms of 2-input NAND gates.		Time spent on Q7:
	ms of 2-input NAND gates.		Time spent on Q7:

b [4 independent] Express XOR in terms of 2-input NOR gates.	

Q8 Universal Muxification of Gates [8 point	s]		Time spent on Q8:
a. NOT A [1 point]	s]	b. A AND B [2 points]	Time spent on Q8:
c. A OR B [2 independent]	d. A N	AND B [3 independent]	