Homework Assignment #6

Reading Assignment:
Chapter 3 and Section 5-2 in the textbook Logic and Computer Design Fundamentals, 5th Edition by Mano

Problem Assignment:
1) (72 pts or 9 pts each) Chapter 3 problems: 50, 51, 52, 53, 54, 55, 57, 64
2) (10 pts) Implement a full-adder using a PAL on the worksheet provided.
3) (10 pts) Implement a 2x1 multiplexer using a PLA on the worksheet provided..
4) (8 pts) Complete the timing diagram for a full adder on the worksheet provided.

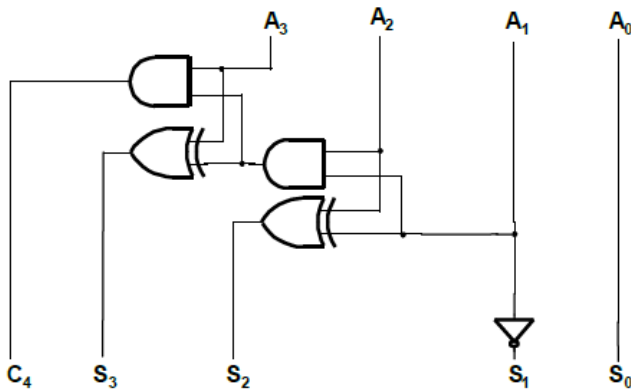## Selected Answers:
3-52)   a) 01001   b) 10000 (= -10000)
3-53)   a) 01001   b) 00000
3-54)   Check the results by converting the results back to decimal. Example: $36 + (-24) = 12$
3-55)   a) 100000 (-32)   b) 110001 (-15) c) 011111 (-33) overflow error
3-57)   Show the original adder circuit and label all values on the circuit to show how it reduces. The result is shown below:


3-64)   (3 of 5 parts shown)

|	S	A	B	C_4	S_3	S_2	S_1	S_0
a)	0	0111	0111	0	1	1	1	0
b)	1	0100	0111	0	1	1	0	1
c)	1	1101	1010	1	0	0	1	1

EGR 270 HW #6 (continued) – ***Turn in this worksheet as part of the assignment***

2) (10 pts) Implement a full-adder using the PAL shown below (similar to the one used in class and to Figure 5-10 in the textbook).
   - Show the equations for the outputs of the full adder in SOP form.
   - Label the inputs and the outputs on the diagram below. The inputs should be labeled A, B, and C_i. The outputs should be labeled S and C_o.
   - Add X's to show all the connections required in the PAL.
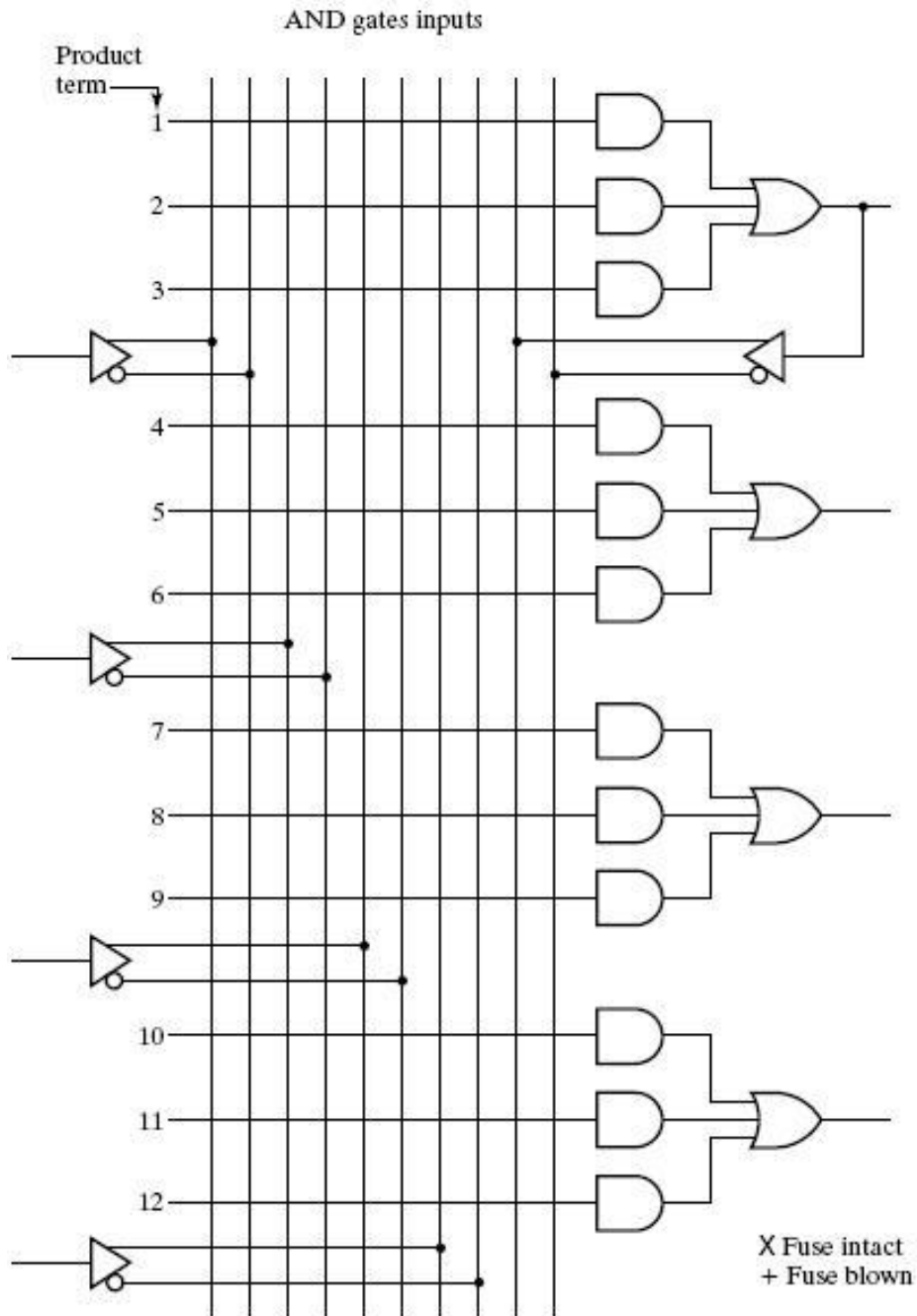
EGR 270 HW #6 (continued) – _Turn in this worksheet as part of the assignment_

3) (10 pts) Implement a 2x1 multiplexer using the PLA shown below (similar to the one used in class and to Figure 5-8 in the textbook).
   - Show the equation for the output of the multiplexer in SOP form.
   - Label the inputs and the outputs on the diagram below. The inputs should be labeled I0, I1, and S, where S is the select line. The output should be labeled Y
   - Add X's to show all the connections required in the PLA.

X Fuse intact

+ Fuse blown
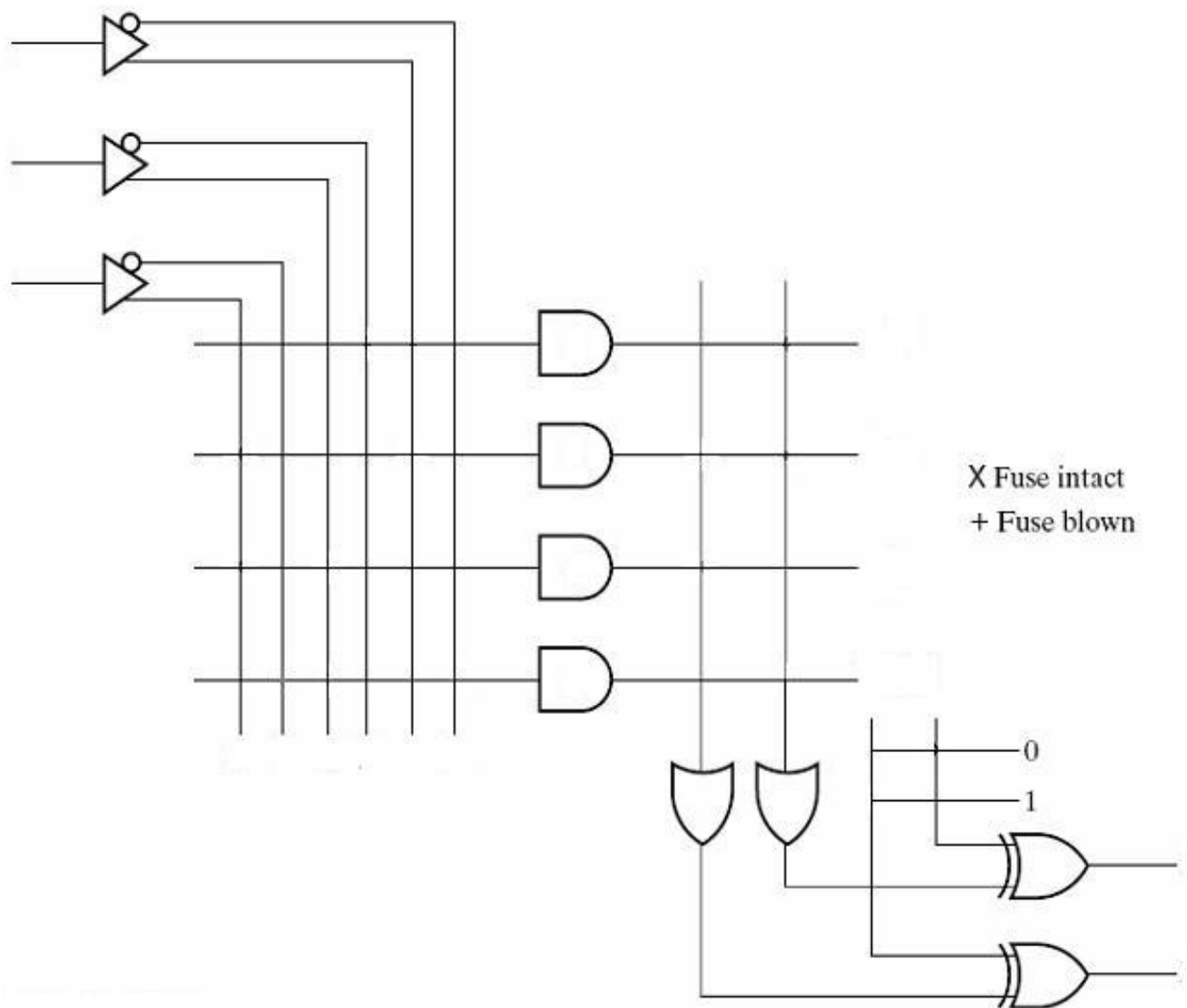
EGR 270 HW #6 (continued) – ***Turn in this worksheet as part of the assignment***

4) Timing Diagrams: (8 pts) Waveforms Ci, A, and B shown below are the inputs to a full adder. Sketch the outputs Co and S.