Chapter 4: Combinational Logic
Solutions to Problems: [33]

Problem: 4-33

Implement a full adder with two 4 x 1 multiplexers.

Solution:

Design procedure:

1. Derive the truth table that defines the required relationship between inputs and outputs.

X	Y	Z	C	C	S	S
0	0	0	0	C=0	0	S=Z
0	0	1	0		1	
0	1	0	0	C=Z	1	S=Z′
0	1	1	1		0	
1	0	0	0	C=Z	1	S=Z′
1	0	1	1		0	
1	1	0	1	C=1	0	S=Z
1	1	1	1		1	

2. We connect the first two variables of the functions to the selection inputs of the multiplexer. The remaining single variable of the function is used for the data inputs.