

Homework 6-9

First Name:

Last Name:

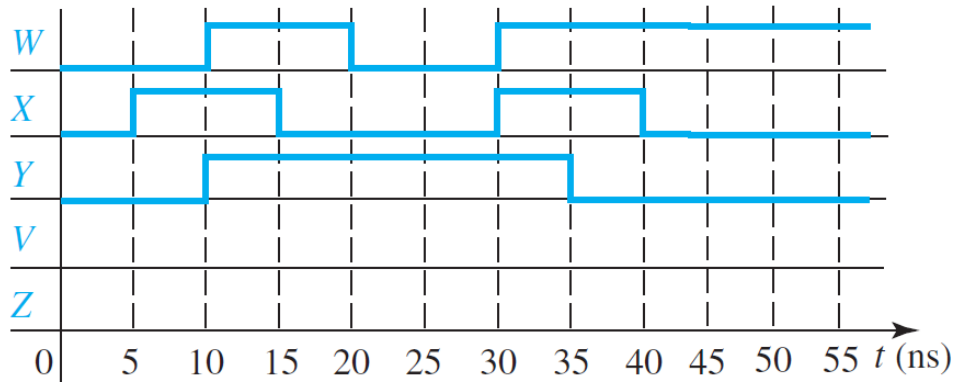
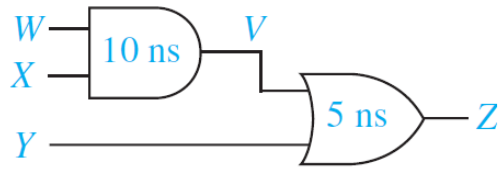
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Q1 For each of the following functions below, find minimum sum-of-products solutions using the Quine-McCluskey method.

$$(a) f(a, b, c, d) = \sum m(1, 5, 7, 9, 11, 12, 14, 15)$$

$$(b) f(a, b, c, d) = \sum m(0, 1, 3, 5, 6, 7, 8, 10, 14, 15)$$

Q2 Draw the timing diagram for V and Z for the circuit below. Assume that the AND gate has a propagation delay of 10 ns and the OR gate has a delay of 5 ns.



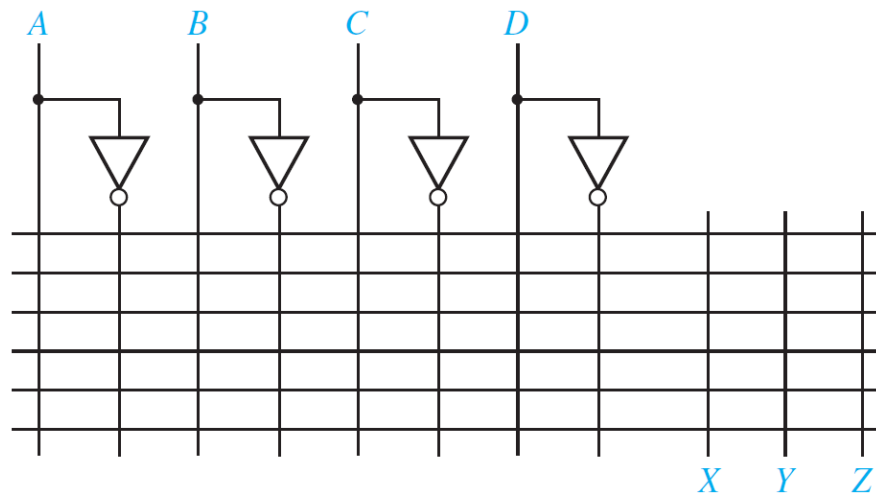
Q3. The following PLA will be used to implement the following equations:

$$X = AB'D + A'C' + BC + C'D'$$

$$Y = A'C' + AC + C'D'$$

$$Z = CD + A'C' + AB'D$$

Indicate the connections that will be made to program the PLA to implement these equations.
Add more horizontal lines if necessary.



Q4. Realize a BCD to excess-3 code converter using a 4-to-10 decoder with active low outputs and a minimum number of gates.

Q5. Braille is a system which allows a blind person to read alphanumerics by feeling a pattern of raised dots. The table shows the correspondence between BCD and Braille. Design a circuit that converts BCD to Braille using PLA by specifying its connection pattern in the following diagram.

				<u><i>W</i></u>	<u><i>X</i></u>
<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>Z</i>	<i>Y</i>
0	0	0	0	.	:
0	0	0	1	.	
0	0	1	0	:	
0	0	1	1	.	.
0	1	0	0	.	:
0	1	0	1	.	.
0	1	1	0	:	.
0	1	1	1	:	:
1	0	0	0	:	.
1	0	0	1	.	.

