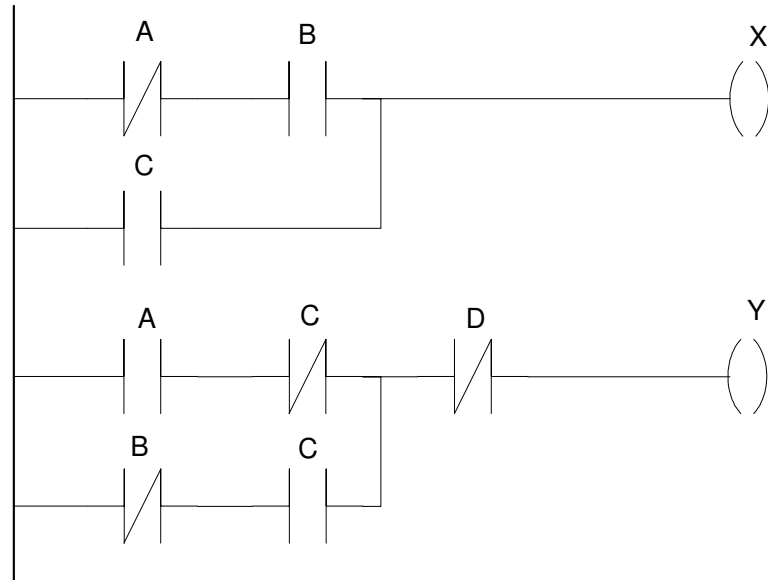


Homework #2: ECE 461 / 661

Intro to Ladder Logic, 1st & 2nd-Order Approximations, Block Diagrams

Ladder Logic

1) Find the logic represented by the following ladder diagram



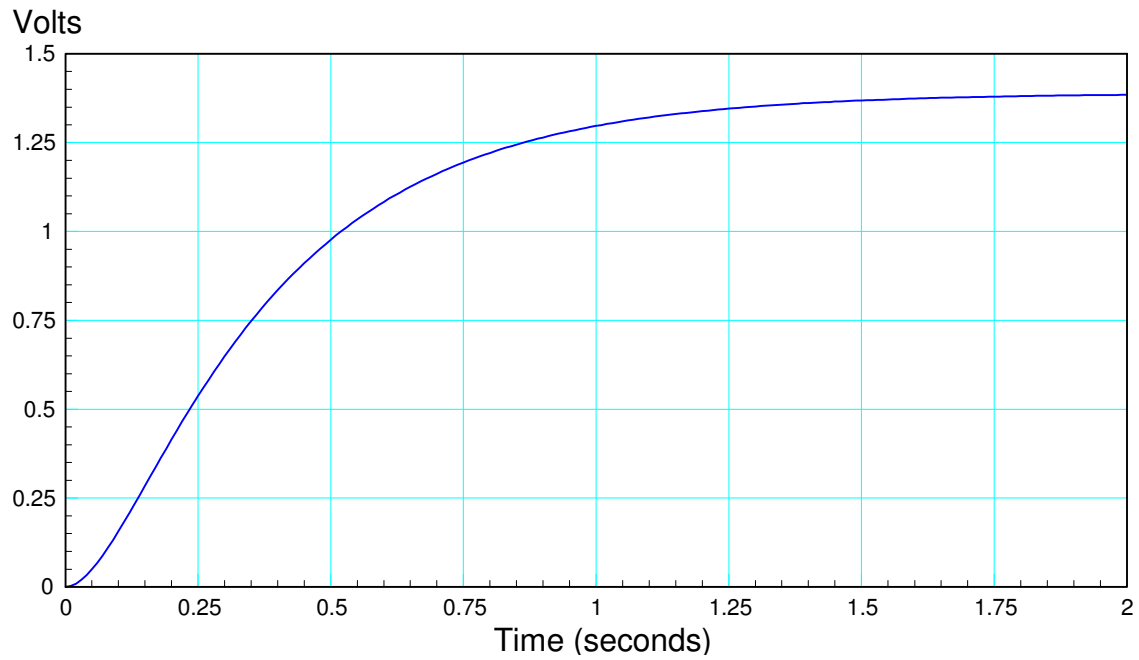
2) Find the logic expression for the following Karnough map.

- Create a ladder diagram to output Y(A, B, C, D)

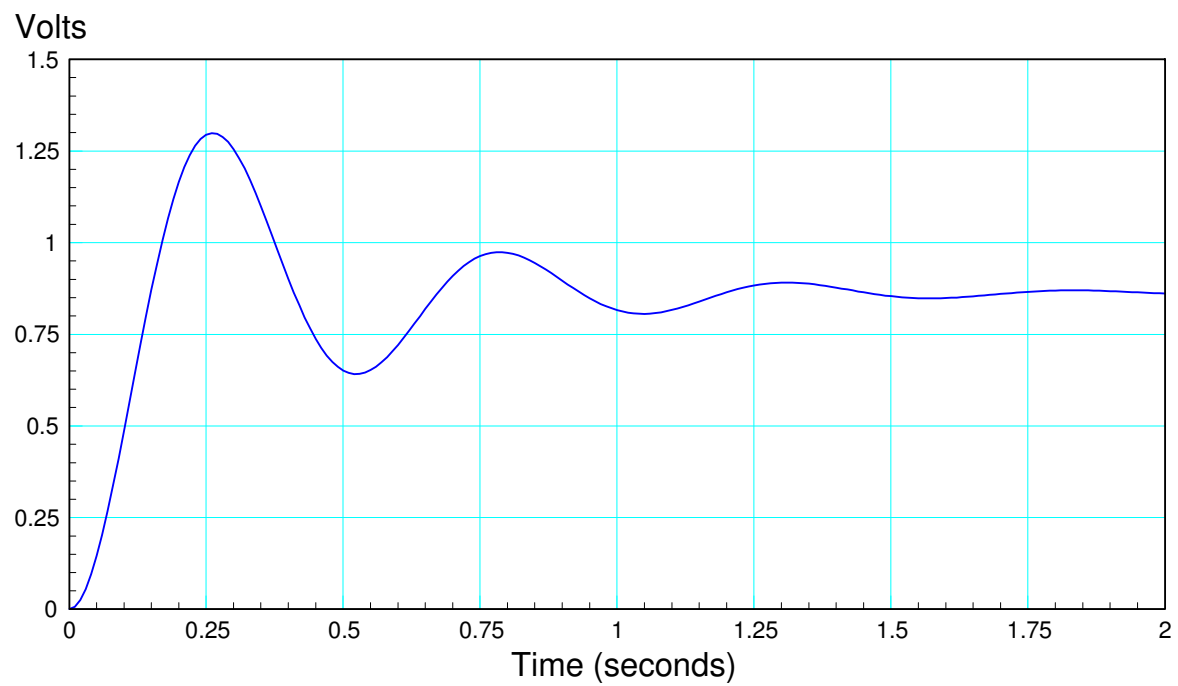
		CD			
		00	01	11	10
AB	00	0	0	1	1
	01	0	x	1	1
	11	0	0	x	0
	10	0	1	1	x

1st & 2nd Order Approximations

3) Find the transfer function, $G(s)$, which has the following step response



4) Find the transfer function, $G(s)$, which has the following step response



5) For the following 5th-order system

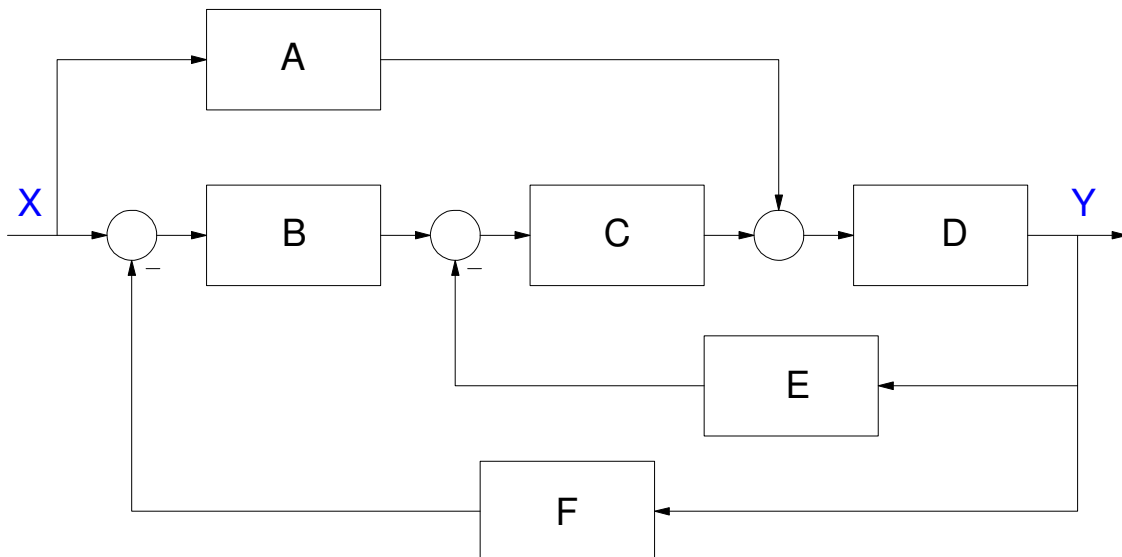
$$Y = \left(\frac{200(s+1)(s+20)}{(s+2+j5)(s+2-j5)(s+20+j10)(s+20-j10)(s+30)} \right) X$$

a) Find a 2nd-order approximation for this system

b) Plot the step response of the 5th-order system and the 2nd-order system

Block Diagrams

6) Simplify the following block diagram to find the transfer function from X to Y



7) Simplify the following block diagram to find the transfer function from X to Y

