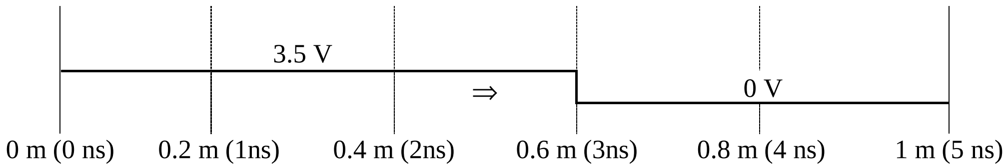
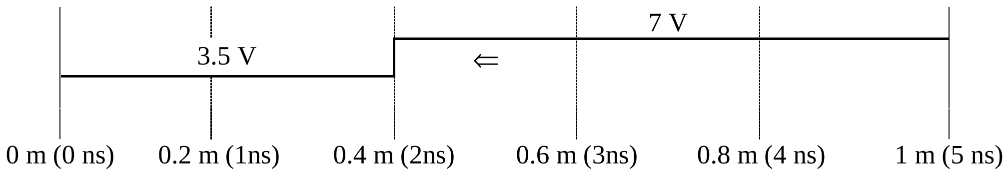
Problem Set 7 Solutions
Professor Fearing Fall 1997
Solutions created by Norman Walker

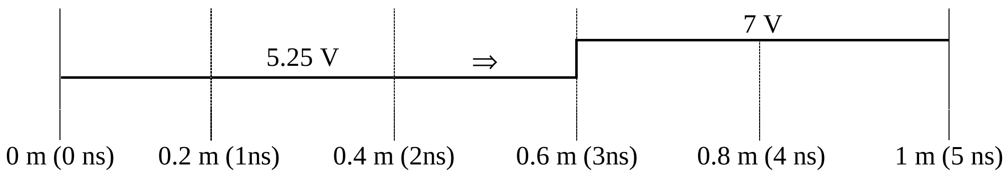
31.
a.
at t = 3 ns



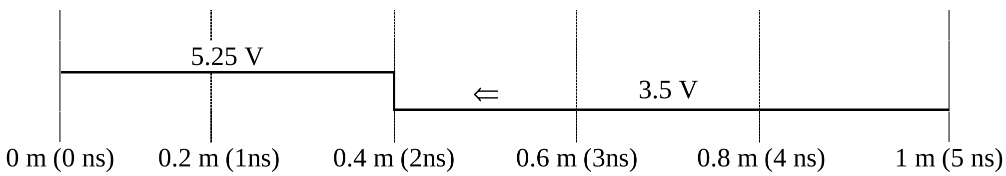
at t = 8 ns



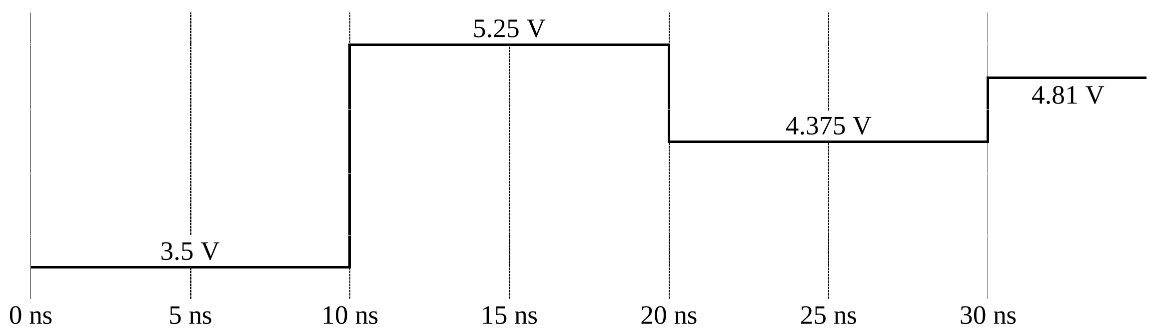
at t = 13 ns



at t = 18 ns

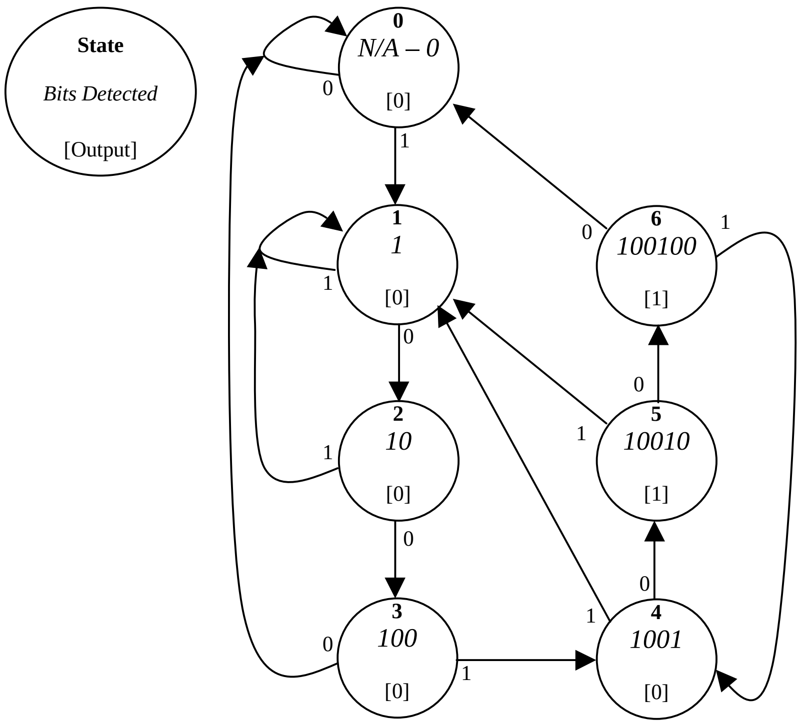


b.

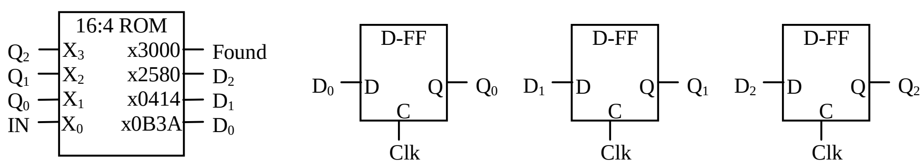


Signal will eventually reach 4.66 V as t ⇒ infinity

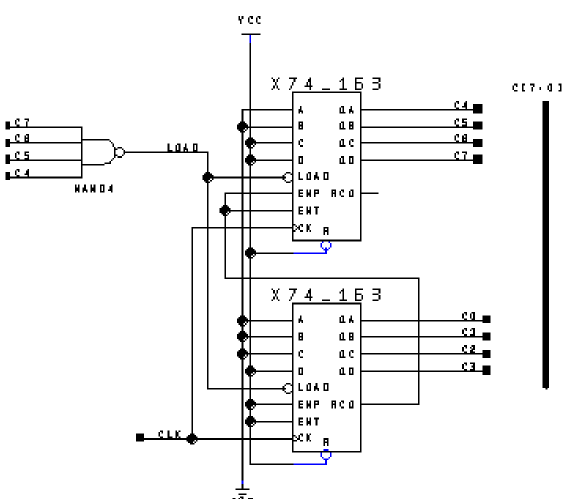
2. From the problem description.

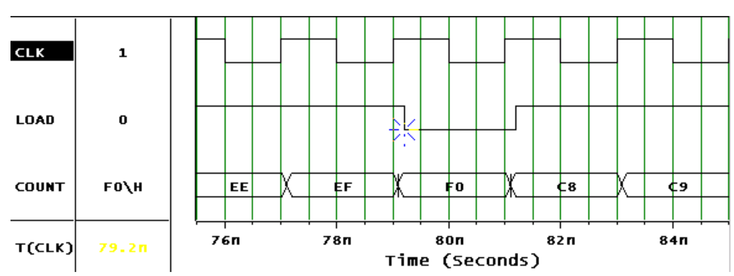


					Binary Values				Hex Value			
	Q_2	Q_1	Q_0	IN	Q_2^*	Q_1^*	Q_0^*	F	Q_2^*	Q_1^*	Q_0^*	F
7	1	1	1	1	0	0	0	0	2	0	0	3
	1	1	1	0	0	0	0	0				
6	1	1	0	1	1	0	0	1				
	1	1	0	0	0	0	0	1				
5	1	0	1	1	0	0	1	0	5	4	B	0
	1	0	1	0	1	1	0	0				
4	1	0	0	1	0	0	1	0				
	1	0	0	0	1	0	1	0				
3	0	1	1	1	1	0	0	0	8	1	3	0
	0	1	1	0	0	0	0	0				
2	0	1	0	1	0	0	1	0				
	0	1	0	0	0	1	1	0				
1	0	0	1	1	0	0	1	0	0	4	A	0
	0	0	1	0	0	1	0	0				
0	0	0	0	1	0	0	1	0				
	0	0	0	0	0	0	0	0				

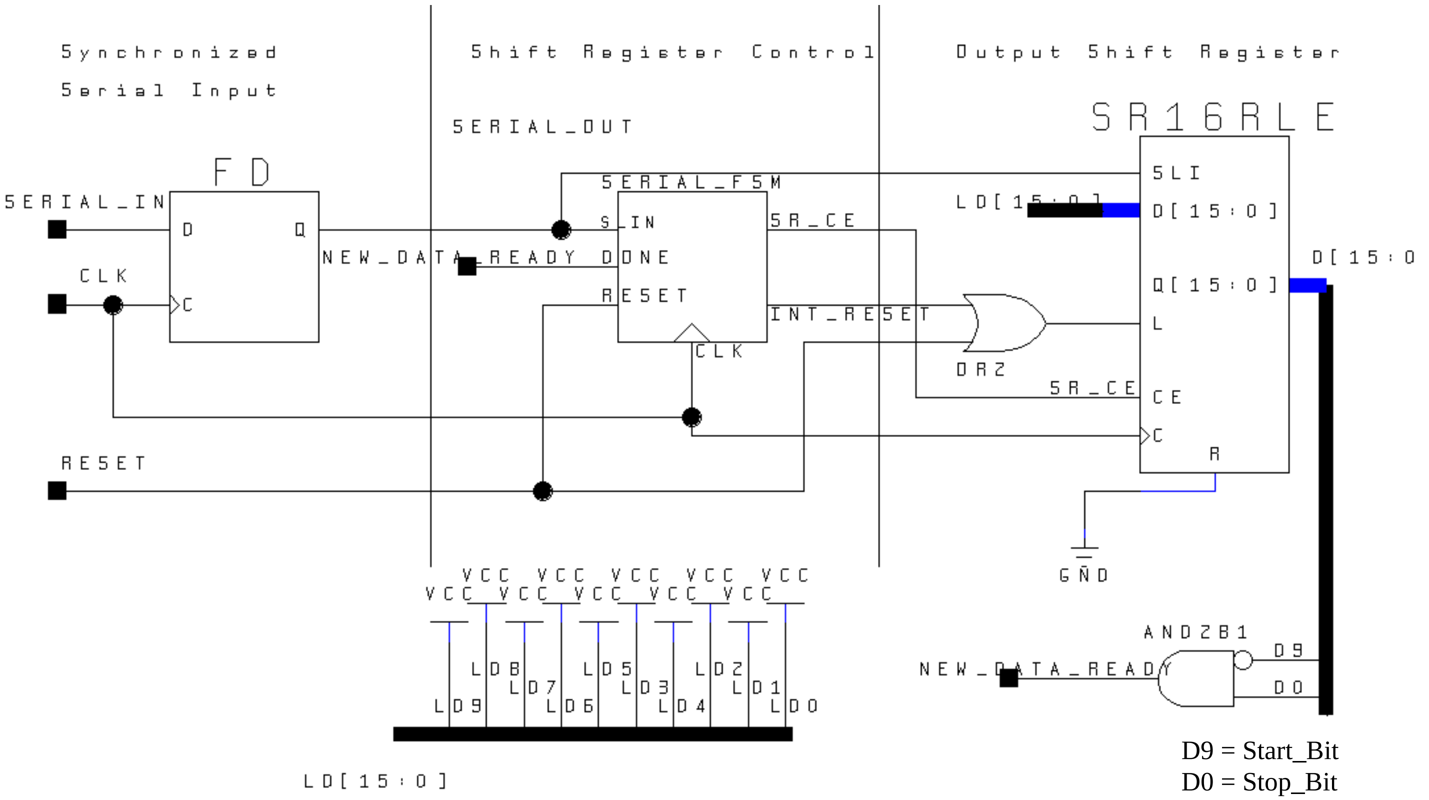


3.



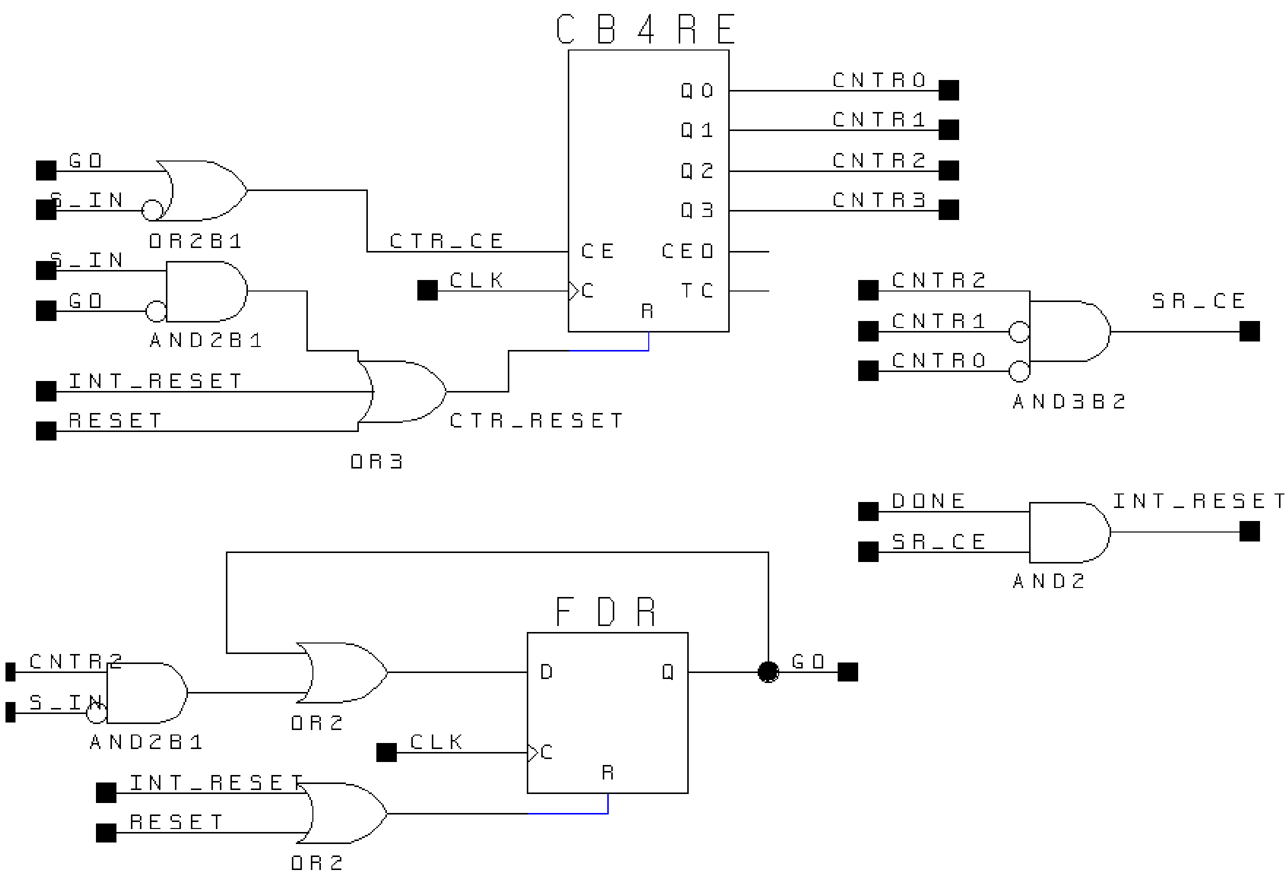


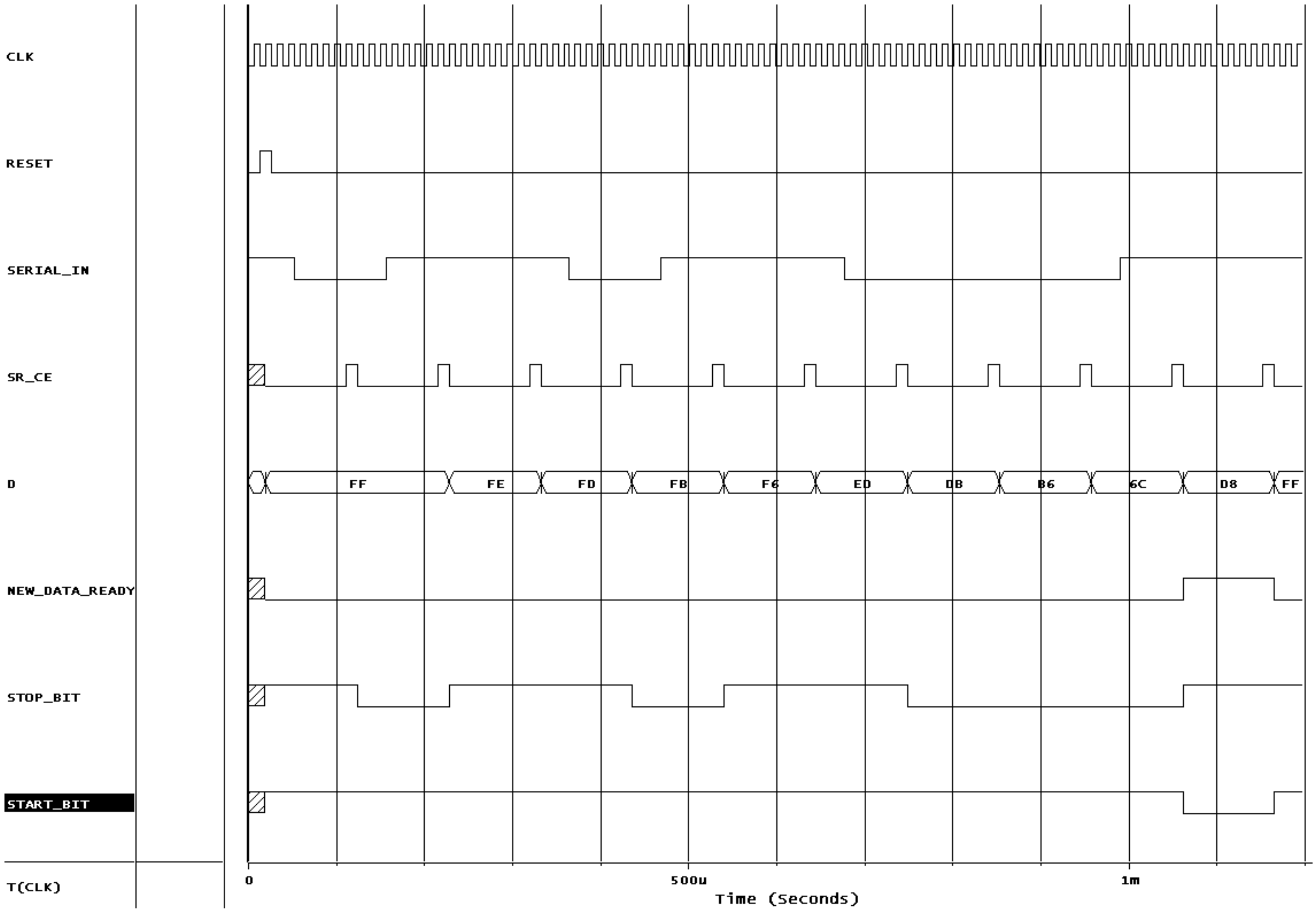
4.

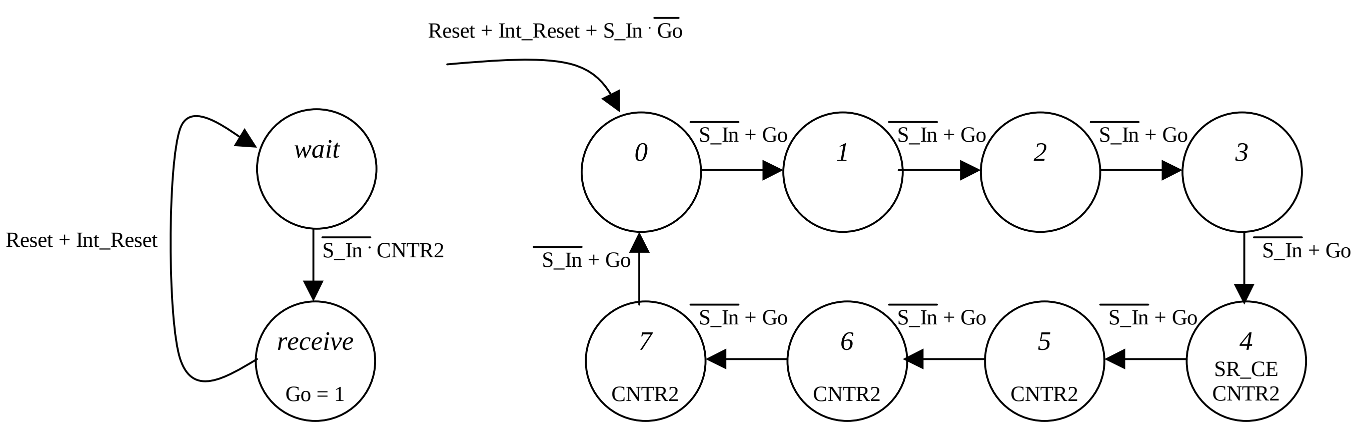


D9 = Start_Bit
D0 = Stop_Bit

SERIAL_FSM




CLK
RESET
SERIAL_IN
SR_CE
D
NEW_DATA_READY
STOP_BIT
START_BIT
T(CLK)
FF
FE
FD
FB
F6
ED
DB
B6
6C
D8
FF
0
500u
1m
Time (Seconds)


Reset + Int_Reset + S_In · $\overline{\text{Go}}$
wait
Reset + Int_Reset
$\overline{\text{S\_In}}$ · CNTR2
receive
Go = 1
0
$\overline{\text{S\_In}}$ + Go
1
$\overline{\text{S\_In}}$ + Go
2
$\overline{\text{S\_In}}$ + Go
3
$\overline{\text{S\_In}}$ + Go
$\overline{\text{S\_In}}$ + Go
7
CNTR2
$\overline{\text{S\_In}}$ + Go
6
CNTR2
$\overline{\text{S\_In}}$ + Go
5
CNTR2
$\overline{\text{S\_In}}$ + Go
4
SR_CE
CNTR2