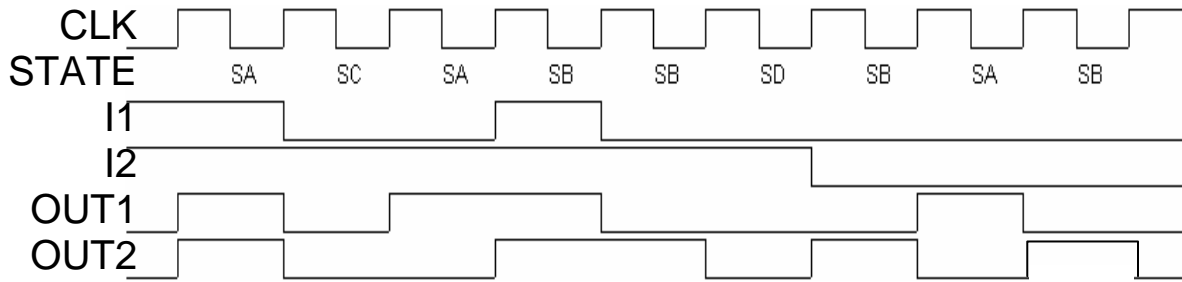
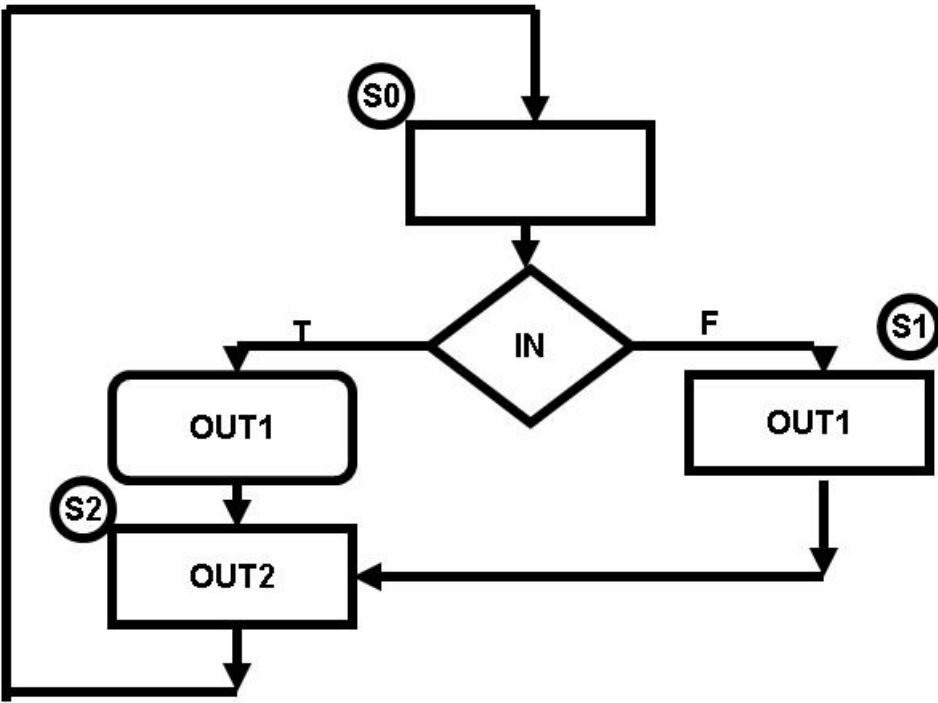


7.3)



7.5)

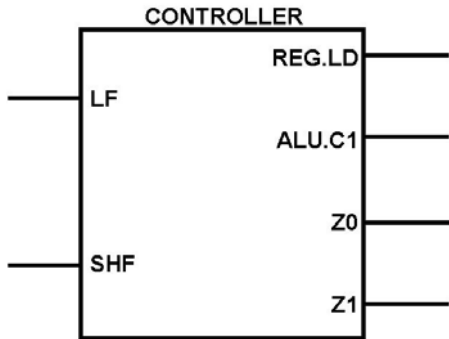


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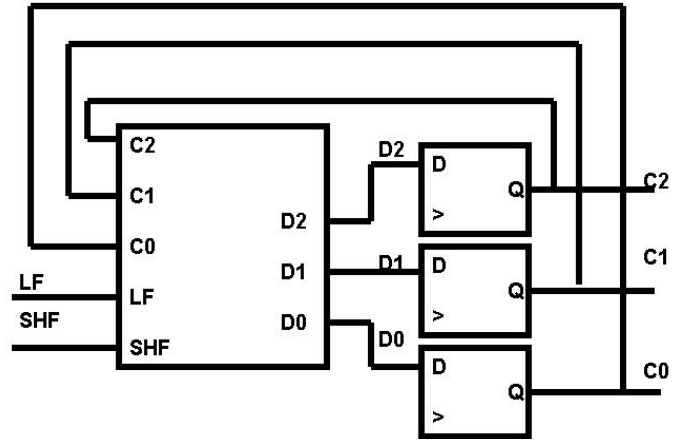
7.8)

a)



b)

STATE GENERATOR



c)

C2	C1	C0	LF	SHF	C2+	C1+	C0+
0	0	0	0	0	0	0	1
0	0	0	0	1	0	1	0
0	0	0	1	0	0	1	1
0	0	0	1	1	0	1	1
0	0	1	0	0	0	1	0
0	0	1	0	1	0	1	0
0	0	1	1	0	0	1	0
0	0	1	1	1	0	1	0
0	1	0	0	0	0	0	0
0	1	0	0	1	0	0	0
0	1	0	1	0	0	0	0
0	1	0	1	1	0	0	0
0	1	1	0	0	1	0	0
0	1	1	0	1	0	1	1
0	1	1	1	0	1	0	0
0	1	1	1	1	0	1	1
1	0	0	0	0	0	0	0
1	0	0	0	1	0	0	0
1	0	0	1	0	0	0	0
1	0	0	1	1	0	0	0
1	0	1	0	0	X	X	X
1	0	1	0	1	X	X	X
1	0	1	1	0	X	X	X
1	0	1	1	1	X	X	X
1	1	0	0	0	X	X	X
1	1	0	0	1	X	X	X
1	1	0	1	0	X	X	X
1	1	0	1	1	X	X	X
1	1	1	0	0	X	X	X
1	1	1	0	1	X	X	X
1	1	1	1	0	X	X	X
1	1	1	1	1	X	X	X

d) LOGIC EQUATIONS:

$$D2 = C1 C0 / SHF$$

$$D1 = /C2 /C1 LF + /C2 /C1 SHF + /C1 C0 + C0 SHF$$

$$D0 = /C2 /C1 /C0 /SHF + /C2 /C1 /C0 LF + C1 C0 SHF$$

$$REG.LD = S0$$

$$ALU.C1 = S1 + S3$$

$$Z0 = S0 /LF SHF$$

$$Z1 = S3 SHF$$

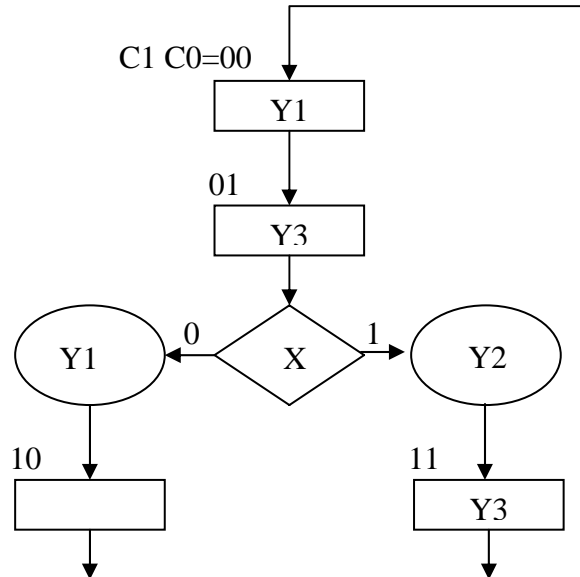
7.15)

WORKING BACKWARDS, WE OBTAIN THE FOLLOWING NEXT-STATE/OUTPUT TABLE:

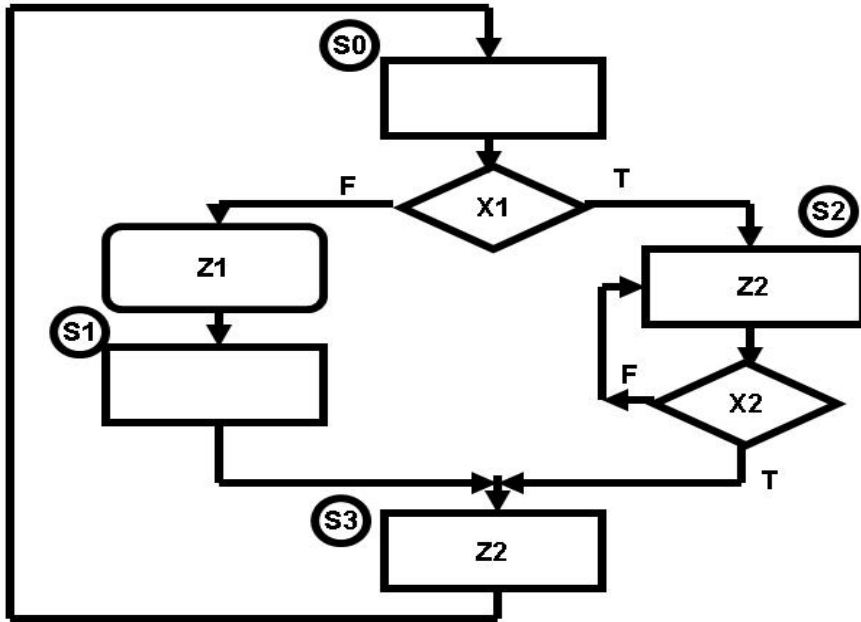
A2	A1	A0	Z4	Z3	Z2	Z1	Z0
C1	C0	X	Y1	Y2	Y3	C1+	C0+
0	0	0	1	0	0	0	1
0	0	1	1	0	0	0	1
0	1	0	1	0	1	1	0
0	1	1	0	1	1	1	1
1	0	0	0	0	0	0	0
1	0	1	0	0	0	0	0
1	1	0	0	0	1	0	0
1	1	1	0	0	1	0	0

FROM THE TABLE, WE CAN OBTAIN THE FOLLOWING ASM CHART:

b)

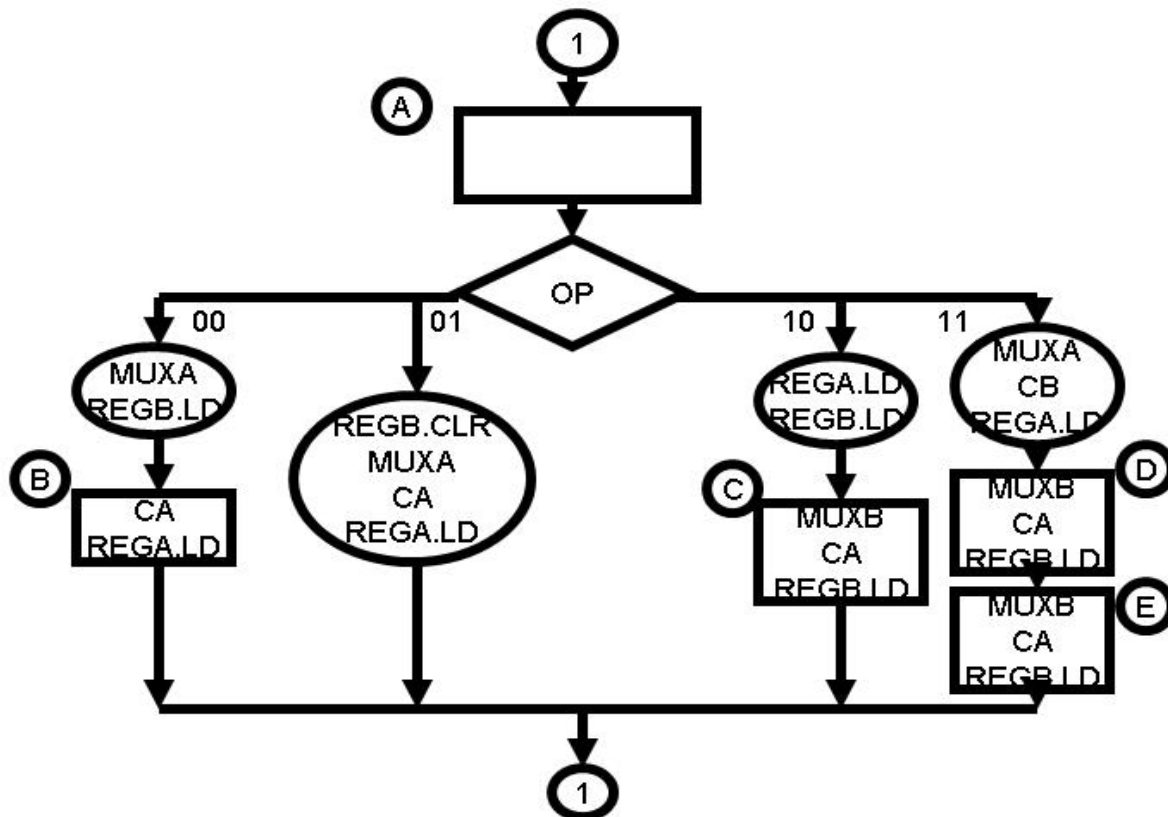


7.18)



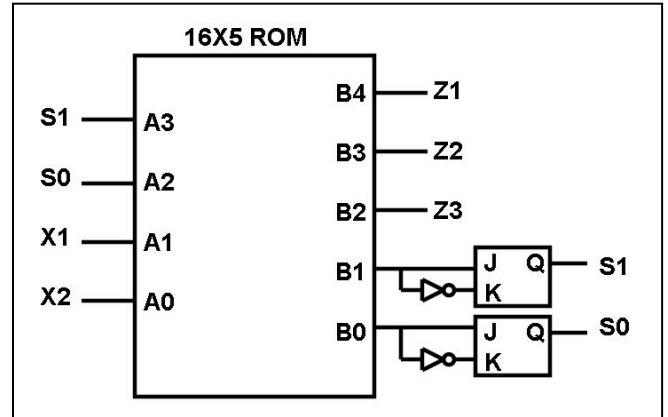
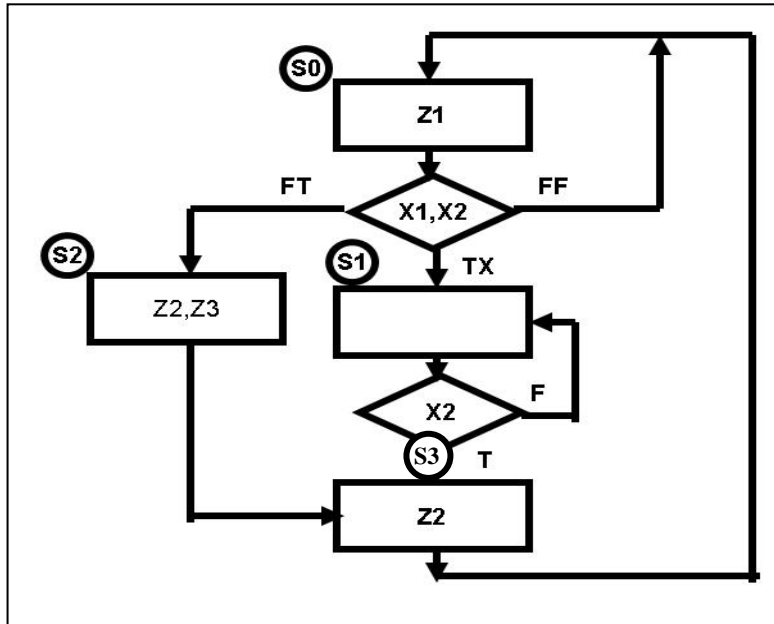
7.19) See next page

7.23)



Homework 6 Solutions

7.19)



LOCATION:			CONTENTS				
S1	S0	X1	Z1	Z2	Z3	J1	J0
A3	A2	A1	B4	B3	B2	B1	B0
00	00		100	00			
00	01		100	10			
00	10		100	01			
00	11		100	01			
01	00		000	01			
01	01		000	11			
01	10		000	01			
01	11		000	11			
10	00		011	11			
10	01		011	11			
10	10		011	11			
10	11		011	11			
11	00		010	00			
11	01		010	00			
11	10		010	00			
11	11		010	00			

In a general state machine, the J's and K's **should be done separately**, possibly eliminating the need for the inverters. But the above solution would work. Doing the J's and K's separately would require two more ROM data bits (B5 and B6). But since most available ROMs are 8-bits wide, this solution would cost less (eliminating the two inverters). Therefore the below solution is better, i.e., worth more points!!!

