Kaushal Bandhia
19CS10039

(1)

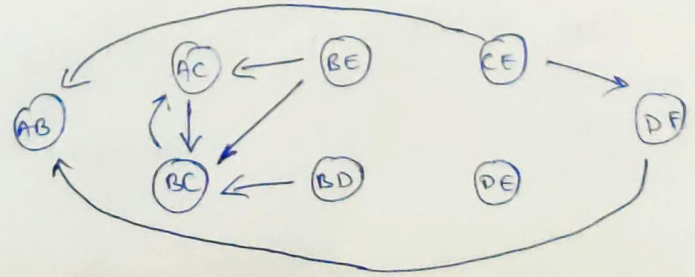
(a)

PS	NS, Z			
	I_1	I_2	I_3	I_4
A	B, 0	–, –	–, –	E, 1
B	A, 0	C, –	–, –	–, –
C	C, 0	A, 1	D, 1	E, –
D	–, –	B, –	–, –	A, –
E	C, –	B, 1	F, –	–, 0
F	F, 1	A, –	E, –	B, 0

	A	B	C	D	E
B	AB, CC, EE				
C	BC, AA, DD, EE	AC, DD, EE			
D	BB, AE	AA, BC	CC, AB, DD, EA		
E	X	AC, BC, FF	CC, AB, DF, EE	CC, BB, FF, AA	
F	X	X	X	FF, AB, EE	CF, BA, FE, BB

	A	B	C	D	E
B	✓				
C	BC	AC			
D	X	BC	X		
E	X	AC, BC	AB, DF	✓	
F	X	X	X	AB	X

⇒



Compatibility Graph.

Closed set of compatibilities

Sl. No.	closed Set of Compatibilities	cost
1	A, B, C, D, E, F	6
2	BE, AC, BC, DF, AB	5
3	CE, AB, DF	3

Case 2 has a clique and can be minimized to cost 3 But we are taking case 3

⇒ Reduced FSM

PS		NS, Output			
Members	Symbol	I_1	I_2	I_3	I_4
AB	α	γ, 0	β, 1	β, 1	β, 1
CE	β	β, 0	γ, 1	γ, 1	β, 0
DF	γ	γ, 1	α, 1	β, 1	α, 1

(b) State Encoding

S_0 S_1

(AB) γ → 00

(CE) β → 01

(DF) α → 10

Input Encoding

i_0 i_1

I_1 → 00

I_2 → 01

I_3 → 10

I_4 → 11

PS	S_0	S_1	Input 00	01	10	11
α	0	0	00, 0	01, 1	01, 1	01, 1
β	0	1	01, 0	00, 1	10, 1	01, 0
γ	1	0	10, 1	00, 1	01, 1	10, 1

(c) Output $= (i_0)'(i_1) + (i_0)(i_1)' + S_0 + (S_1)'(i_1)$

$S_{0\,next} = (S_1)(i_0)(i_1)' + (S_0)(i_0)'(i_1)' + (S_0)(i_0)(i_1)$

$S_{1\,next} = (S_0)'(S_1)'(i_1) + (S_1)(i_0)'(i_1)' + (S_1)'(i_0)(i_1)' + (S_0)'(i_0)(i_1)$

S_0	S_1	i_0	i_1	S_{0next}	S_{1next}	J_A	K_A	J_B	K_B
0	0	0	0	0	0	0	x	0	x
0	0	0	1	0	1	0	x	1	x
0	0	1	0	0	1	0	x	1	x
0	0	1	1	0	1	0	x	1	x
0	1	0	0	0	1	0	x	x	0
0	1	0	1	0	1	0	x	x	1
0	1	1	0	0	1	0	x	x	1
0	1	1	1	1	0	1	x	x	0
1	0	0	0	1	0	x	0	0	x
1	0	0	1	0	0	x	1	0	x
1	0	1	0	0	1	x	1	1	x
1	0	1	1	0	1	x	1	x	0
1	1	0	0	x	x	x	x	x	x
1	1	0	1	x	x	x	x	x	x
1	1	1	0	x	x	x	x	x	x
1	1	1	1	x	x	x	x	x	x