

DEC Test.
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19EE10039.

HMJQ.

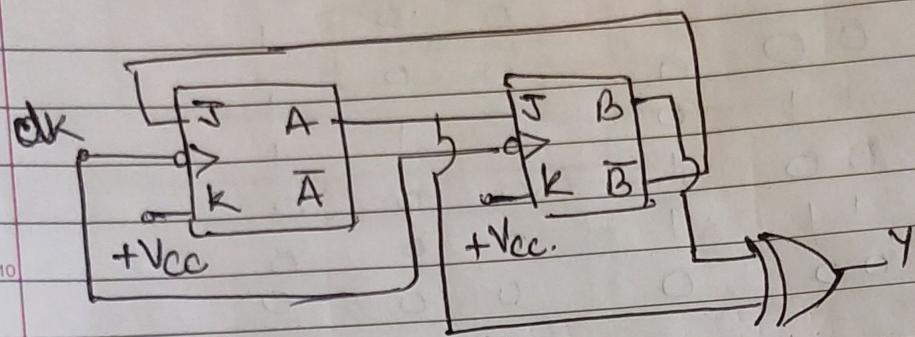
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Questions.

- Q1. max length sequence generation using shift register=? Analyze circuit.
Draw timing table for A, B, Y, clk



- Q2. Design counter which behaves like Mod 5 or Mod 3 depending on initial state
000 → 001 → 010 → 011 → 100 → 000 ...
or, 101 → 110 → 111 → 101 ...
using JK flip flop.
Draw circuit diagram.

- Q3. Draw state transition diagram for Mealy model of overlapping sequence detector (detect 1001).

Show how to use D flip-flop and Decoder OR combination to realize it.

- Q4. Use partition table method to eliminate redundant states, if any.

Table → .

Present State	X	C
a		
b		
c		
d		
e		
f		
g		

Aus1.

clk

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Present State	Next State		Op.		
	$x=0$	$x=1$	$x=0$	$x=1$	
a	a	b	0	0	
b	c	d	0	0	
c	a	d	0	0	
d	e	f	0	1	
e	a	f	0	1	
f	g	f	0	1	
g	a	f	0	1	

Ans 2.

		BNAN			
CW		00	01	11	W
0	0	0	0	p	x
	1	0	1	p	x

$$J_C = B_W C_W$$

BNAV					
CIV		OD	SI	II	WD
0	x	x	0	1	
1	x	x	0	0	

$$K_C = \overline{P}_n \overline{C}_n$$

BNAW		00	01	11	10
CW	O	0	a	a	0
O	0	a	a	0	a
1	1	a	a	1	1

$$JB = C_N$$

BNAW		00	01	11	W
CN	N	0	0	Q	A
0	A	0	0	Q	A
1	A	1	1	1	A

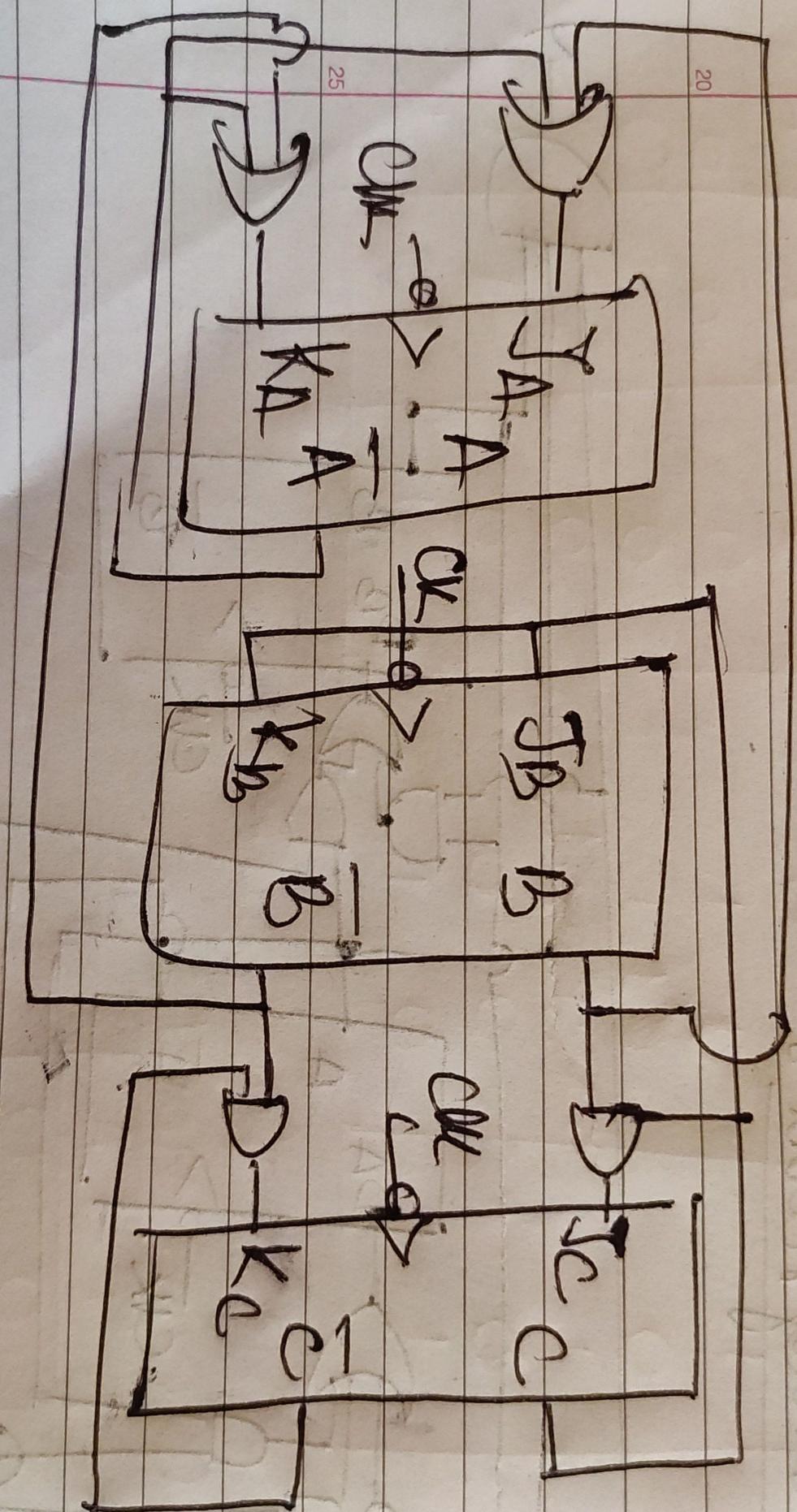
$$k_B = Cw$$

CN	BRUAN	OD	01	11	W
0 30	1	1		0	x
1	x	x		x	x

$$J_A = \bar{A}n + Bn$$

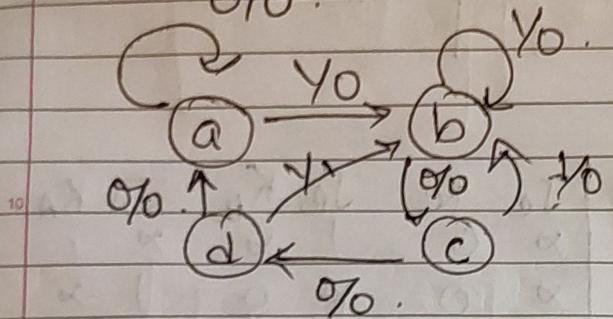
		Bv An	Cn	00	01	11	W
			0	(x)	(x)	(x)	(x)
			1	(x)	(x)	(x)	(x)

$$RA = \frac{1}{B_N + A_N}$$



Ans 8

where '1001'
 $a \rightarrow x$ bit decoded 00
 $b \rightarrow 1$ bit 01
 $c \rightarrow 2$ bit 10
 $d \rightarrow 3$ bit 010.

Mealy model :-

Present State	i/p.	Next state	o/p.	DA	DB
B _N A _N	X	B _{N+1} A _{N+1}	Y		
0 0	0	0 0	0	0	0
0 0	1	0 1	0	1	0
0 1	0	1 0	0	1	1
0 1	1	0 1	0	0	0
1 0	0	1 1	0	1	0
1 0	1	0 1	0	1	1
1 1	0	0 0	0	1	1
1 1	1	0 1	1	0	1

using D flip flop:
 State assignments:

State	B	A
a	0	0
b	0	1
c	1	0
d	1	1

JA KA
X 1
1 X
X 1
0 X

Aus 3 continued...

	X	DA	DB	Y
0	0	00	01	1
0	1	11	10	0
1	0	00	11	1
1	1	10	00	0

$$DA = (X \bar{A} \bar{N}) + (\bar{X} A \bar{N}) + (B \bar{N} \cdot \bar{A} N)$$

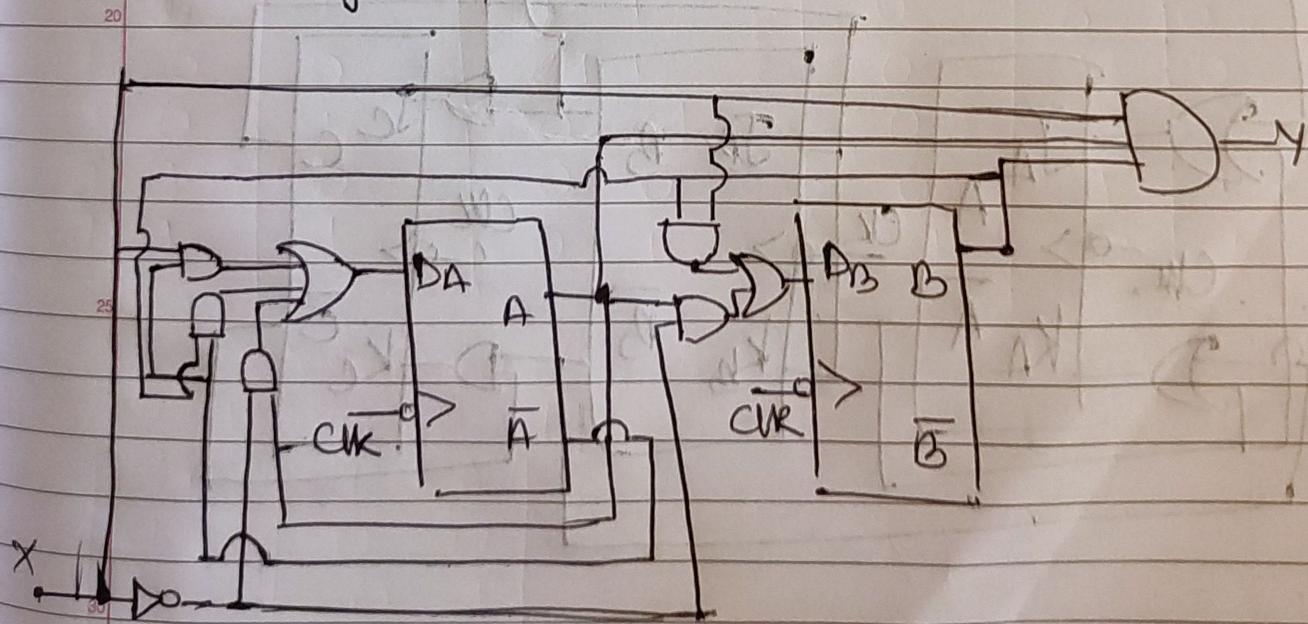
	X	DA	DB	Y
0	0	00	01	1
0	1	11	10	0
1	0	00	11	1
1	1	10	00	0

$$DB = (X B \bar{N}) + (\bar{X} A \bar{N}).$$

	X	DA	DB	Y
0	0	00	01	1
0	1	11	10	0
1	0	00	11	1
1	1	10	00	0

$$Y = X B \bar{N} + A \bar{N}.$$

Circuit diagram :-



Ans 4.

Present State.

Next State,

O/P.

	X=0	X=1	X=0	X=1
a	a	b	0	0
b	c	d	0	0
c	a	d	0	0
d	e	f	0	1
e	a	f	0	1
f	g	f	0	1
g	a	f	0	1

Ans 3

Present State

a

b

c

d

partition.

Partition Block.

P0.

(a b c d e f g.)

O/P X=0

0 0 0 0 0 0 0.

O/P. X=1.

0 0 0 1 1 1 1

Reset.

P1.
Next State X=0
Next State X=1

(a b c)(d e f g).

anagrammatic \rightarrow acadeaga

a d d d f f f f f

00000

P2
Next State X=0
Next State X=1

(a)(b c)(d e f g).

a | c a e g a a.
b | d d f f f f f

P3.
Next State X=0
Next State X=1.

(a)(b)(c)(d e f g).

a | c a e g a a.
b | d d f f f f f

df

$\equiv e^2 g.$

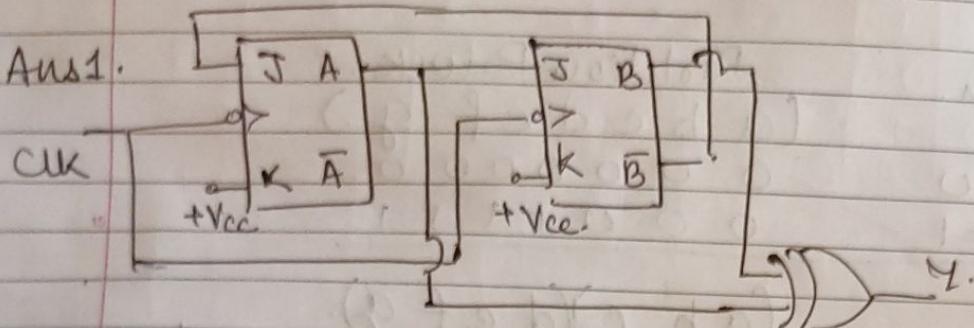
P & (a)(b)(c)(df)(eg),
5 state.

this 7 state table \rightarrow [5 state]
reduced to

b	c	d	o	o	
c	a	d	o	o	
d	e	f	o	1	
e	a	f	o	1	
f	g	f	o	1	
g	a	f	o	1	

Answers.

Aus1.



$$A \rightarrow 0100100$$

$$B \rightarrow 0010010$$

$$Y \rightarrow 10010010$$

Sequence $00 \rightarrow 01 \rightarrow 01 \rightarrow 00$

~~Ans~~ Y → is pulse with Y3 D.

$$AB = 00$$

$$= 0.75 + 0.65 - 0.1$$

$$= 2.6.$$