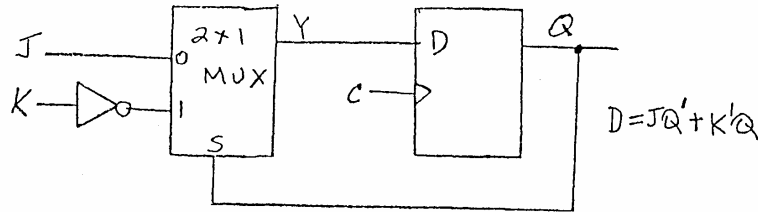
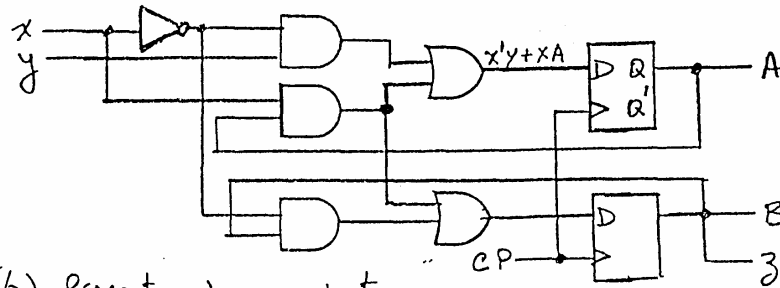


5-2

Home work (6) Chapter 5



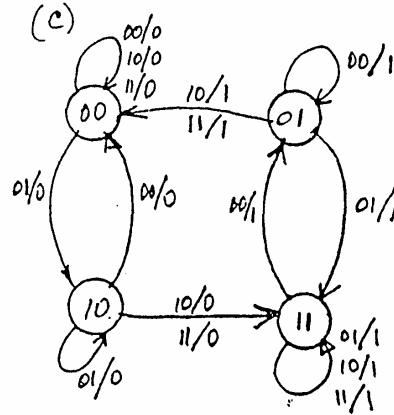
5-6 (a)



(b)

| Present state AB | inputs xy | Next state AB | output z |
|---------------------|--------------|------------------|-------------|
| 00 | 00 | 00 | 0 |
| 00 | 01 | 10 | 0 |
| 00 | 10 | 00 | 0 |
| 00 | 11 | 00 | 0 |
| 01 | 00 | 01 | 1 |
| 01 | 01 | 11 | 1 |
| 01 | 10 | 00 | 1 |
| 01 | 11 | 00 | 1 |
| 10 | 00 | 00 | 0 |
| 10 | 01 | 10 | 0 |
| 10 | 10 | 11 | 0 |
| 10 | 11 | 11 | 0 |
| 11 | 00 | 01 | 1 |
| 11 | 01 | 11 | 1 |
| 11 | 10 | 10 | 1 |
| 11 | 11 | 11 | 1 |

(c)



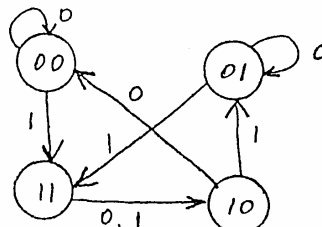
5-9

$$A(t+1) = J_A A' + K_A A$$

$$= xA' + BA$$

$$B(t+1) = J_B B' + K_B B$$

$$= xB' + A'B$$



5-12

| Present state | Next state | | Output | |
|---------------|------------|---|--------|---|
| | 0 | 1 | 0 | 1 |
| a | f | b | 0 | 0 |
| b | d | a | 0 | 0 |
| d | g | a | 1 | 0 |
| f | f | b | 1 | 1 |
| g | g | d | 0 | 1 |

5-19(a)

| Present state | Input | Next state | output |
|---------------|-------|------------|--------|
| ABC | x | ABC | y |
| 000 | 0 | 011 | 0 |
| 000 | 1 | 100 | 1 |
| 001 | 0 | 001 | 0 |
| 001 | 1 | 100 | 1 |
| 010 | 0 | 010 | 0 |
| 010 | 1 | 000 | 1 |
| 011 | 0 | 001 | 0 |
| 011 | 1 | 010 | 1 |
| 100 | 0 | 010 | 0 |
| 100 | 1 | 011 | 0 |

$d(A,B,C,x) = \Sigma(10,11,12,13,14,15)$

| AB | Cx' | 01 | 11 | 10 |
|----|-------|----|----|----|
| 00 | | 1 | 1 | |
| 01 | | | | |
| 11 | | x | x | x |
| 10 | | | | x |

$DA = A'B'x$

| AB | Cx' | 01 | 11 | 10 |
|----|-------|----|----|----|
| 00 | | 1 | | |
| 01 | | 1 | | |
| 11 | | x | x | x |
| 10 | | 1 | 1 | x |

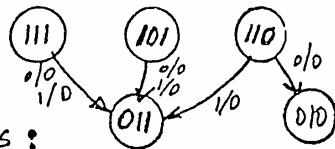
$DB = A + C'x' + BCx$

| AB | Cx' | 01 | 11 | 10 |
|----|-------|----|----|----|
| 00 | | 1 | | |
| 01 | | | | 1 |
| 11 | | x | x | x |
| 10 | | 1 | x | x |

$DC = Cx' + Ax + A'B'x'$

| AB | Cx' | 01 | 11 | 10 |
|----|-------|----|----|----|
| 00 | | 1 | 1 | |
| 01 | | 1 | | |
| 11 | | x | x | x |
| 10 | | | | x |

$y = A'x$



self-correcting

(b) Use JK flip flops: same state table as in part (a).

| Flip-flop inputs | | | | | |
|------------------|----|----|----|----|----|
| JA | KA | JB | KB | JC | KC |
| 0 | x | 1 | x | 1 | x |
| 1 | x | 0 | x | 0 | x |
| 0 | x | 0 | x | x | 0 |
| 1 | x | 0 | x | x | 1 |
| 0 | x | x | 0 | 0 | x |
| 0 | x | x | 1 | 0 | x |
| 0 | x | x | 1 | x | 0 |
| 0 | x | x | 0 | x | 1 |
| x | 1 | 1 | x | 0 | x |
| x | 1 | 1 | x | 1 | x |

$JA = B'x$

$KA = 1$

$JB = A + C'x'$

$KB = C'x' + Cx'$

$JC = Ax + AB'x'$

$KC = x$

$y = A'x$

self-correcting because $KA = 1$