

2.

State table.

| current state | Next state<br>$w=0$ | Next state<br>$w=1$ | out put |
|---------------|---------------------|---------------------|---------|
| A             | A                   | B                   | 0       |
| B             | A                   | C                   | 0       |
| C             | E                   | D                   | 0       |
| D             | E                   | F                   | 0       |
| E             | A                   | G                   | 0       |
| F             | E                   | F                   | 1       |
| G             | A                   | C                   | 1       |

$y_3 y_2 y_1 = 000$

001

010

110

011

100

101

A

B

C

D

E

F

G

2.

State table.

| current state | Next state<br>w=0 | w=1   | out put |
|---------------|-------------------|-------|---------|
| A 0 0 0       | 0 0 0             | 0 0 1 | 0       |
| B 0 0 1       | 0 0 0             | 0 1 0 | 0       |
| C 0 1 0       | 0 1 1             | 1 1 0 | 0       |
| D 1 1 0       | 0 1 1             | 1 0 0 | 0       |
| E 0 1 1       | 0 0 0             | 1 0 1 | 0       |
| F 1 0 0       | 0 1 1             | 1 0 0 | 1       |
| G 1 0 1       | 0 0 0             | 0 1 0 | 1       |

$y_2 y_1$   $y_3 w$

|    | 00 | 01 | 11 | 10 |
|----|----|----|----|----|
| 00 | 0  | 1  | 0  | 1  |
| 01 | 0  | 0  | 0  | 0  |
| 10 | 0  | 1  | X  | X  |
| 11 | 1  | 0  | X  | X  |

$$\overline{y_3} w \overline{y_2} \overline{y_1} + y_2 y_1 w + y_3 w \overline{y_1} + y_2 \overline{y_1} w$$

$y_2$ :

| $y_3 w$<br>$y_2 y_1$ | 00 | 01 | 11 | 10 |
|----------------------|----|----|----|----|
| 00                   | 0  | 0  | 0  | 1  |
| 01                   | 0  | 1  | 1  | 0  |
| 10                   | 0  | 0  | x  | x  |
| 11                   | 1  | 1  | x  | x  |

$$y_3 y_2 \bar{y}_1 + \bar{y}_2 y_1 w + y_3 \bar{w} \bar{y}_1$$

$y_3$ :

| $y_3 w$<br>$y_2 y_1$ | 00 | 01 | 11 | 10 |
|----------------------|----|----|----|----|
| 00                   | 0  | 0  | 1  | 0  |
| 01                   | 0  | 0  | 0  | 0  |
| 10                   | 0  | 1  | x  | x  |
| 11                   | 0  | 1  | x  | x  |

$$y_3 w \bar{y}_1 + y_2 w$$