6.13. The flow table is shown below.

	TR 00	01	11	10
1	①,0	2,0	-	3,0
2	1,0	②,0	7,0	-
3	4,-	-	7,0	③,0
4	④,1	5,1	-	8,1
5	1,-	⑤,1	6,1	-
6	-	2,-	⑥,1	3,-
7	-	5,-	⑦,0	3,0
8	1,-	-	6,1	⑧,1

6.54. For the state assignment used for the Figure 6.78b, y1 = 1 for state-3, where the balance is 10¢, and y2 = 1 for state-2, where the balance is 5¢. So we can specify an indicator light driven by y1 to indicate a 10¢ balance, and another light driven by y1 to indicate a 5¢ balance. This illustrates nicely how a pulse-mode circuit can generate both pulse outputs and steady state outputs.

6.55. (a) There are four situations in which dimes are returned, three of them in the q-column, and one in the r-column. For the r-column case, with balance 10¢, instead of refunding a dime, we might have the system refund a nickel and set the new balance to 5¢ by setting the next-state entry in row-3 to 2,N. In the q-column, for each state, a candy bar (priced at 15¢) will be emitted, and the effective new balance will be 10¢ greater than the previous balance. For row-1, instead of returning a dime and leaving the balance at 0 (state-1), we can refund 5¢ and change the balance to 5¢ (row-2). Similarly, for row-2, we can refund 5¢ and set the new balance to 10¢. We cannot avoid refunding a dime for state-3, since there is no provision for a balance exceeding 10¢ or for ejecting two candy bars. The resulting flow table is shown below.

Bal		n	d	q	r	y1y2
0	1	2	3	2CN	1	0 0
5	2	3	1C	3CN	1N	0 1
10	3	1C	2C	3CD	2N	1 0

(b) The new logic expressions are:

$T1 = (n\bar{y}1+ny2)+(d\bar{y}2)+(q\bar{y}2)+(ry1) = n(y1+\underline{y2})+d\bar{y}2+q\bar{y}2+ry1$

$T2 = (n\bar{y}1)+(dy1+dy2)+(q\bar{y}1)+(ry1+ry2) = n\bar{y}1+(d+r)(\underline{y1+y2})+q\bar{y}1$

$C = (ny1)+(dy1+dy2)+(q) = ny1+d(\underline{y1+y2})+q$

$D = (qy1) = qy1$

$N = (q\bar{y}1)+(ry1+ry2) = q\bar{y}1+r(\underline{y1+y2})$

(The logic above is considerably more costly than that for the original solution. But, it might be worth the price if the operation of the system is significantly improved.)