Table 7.14: PODEM ATPG decision steps for example in Figure 7.22.

Step	Action
1.	Select path $s - Y$
2.	Initial objective: Set r to 1
3.	Backtrace from r
4.	Implications in stack: $A = 0$
5.	Forward implications: $d = 0$, $X = 1$
6.	Initial objective: Set r to 1
7.	Backtrace from r again
8.	Implications in stack: $A = 0$, $B = 1$
9.	Forward implications: $k = 1$, $m = 0$, $r = 1$, $q = 1$, $Y = 1$, $s = \overline{D}$, $u = \overline{D}$, $v = \overline{D}$, $Z = 1$.
10.	X-PATH-CHECK shows paths $s - Y$ and $s - u - v - Z$ are blocked (the D-frontier disappeared), so backtrack.
11.	Set $B = 0$ (alternate assignment)
12.	Forward implications: $d = 0$, $X = 1$, $m = 1$, $r = 0$. Conflict – fault not sensitized. Backtrack.
13.	Set $A = 1$ (alternate assignment)
14.	Backtrace from r again.
15.	Set $B = 0$.
16.	Forward implications: $d = 0$, $X = 1$, $m = 1$, $r = 0$. Conflict – fault not sensitized. Backtrack.
17.	Set $B = 1$ (alternate assignment)
18.	Forward implications: $d = 1$, $m = 1$, $r = 1$, $q = 0$, $s = \overline{D}$, $v = \overline{D}$, $X = 0$, $Y = \overline{D}$, and the fault is tested.

In the example, since path $s - Y$ has level distance 1 from a PO, and path $s - u - v - Z$ has level distance 2 from a PO, PODEM chooses path $s - Y$ as the fault propagation path. X-PATH-CHECK determines that there is an X path along path $s - Y$ to PO Y, so the *initial objective* is to set r (the driver of s) to a 1 to sensitize the fault. Since both inputs of XOR gate r must be controlled to define r, PODEM picks the hardest-to-control input n with an objective of setting it to 0. This leads to various intermediate objectives listed in Table 7.15, and results in the implication $A = 0$. A forward implication from that results in $d = 0$, and $X = 1$. However, this still does not define r, so backtracing from r occurs again. This leads to the primary input assignment $B = 1$. Forward implications from that are $k = 1$, $m = 0$, $r = 1$, $q = 1$, $Y = 1$, $s = \overline{D}$, $u = \overline{D}$, $v = \overline{D}$, and $Z = 1$.

At this point, X-PATH-CHECK indicates that the original propagation path, $s - Y$, no longer has an X path to PO Y, and that path $s - u - v - Z$ also cannot propagate a fault effect. The *D-frontier* is $\{\ \}$. The algorithm backtracks and chooses the alternate assignment for B, $B = 0$. Forward implications from this yield $d = 0$, $X = 1$, $m = 1$, $r = 0$. There is a conflict at s because the fault is not sensitized, so