

$$7.1 \quad (1) \quad (q_0, 010010, Z_0) \vdash \begin{cases} (q_1, 010010, Z_0) \vdash (q_1, 10010, Z_0) \vdash \begin{cases} (q_1, 0010, Z_0) \textcircled{1} \\ (q_2, 0010, Z_0) \textcircled{2} \end{cases} \\ (q_2, 010010, Z_0) \vdash (q_3, 10010, 0Z_0) \vdash \begin{cases} (q_4, 0010, 0Z_0) \textcircled{3} \\ (q_5, 0010, 0Z_0) \textcircled{4} \end{cases} \end{cases}$$

$$\textcircled{1} \quad (q_1, 0010, Z_0) \vdash (q_1, 010, Z_0) \vdash (q_1, 10, Z_0) \vdash \begin{cases} (q_1, 0, Z_0) \vdash (q_1, \varepsilon, Z_0) \text{不成功} \\ (q_2, 0, Z_0) \vdash (q_2, \varepsilon, 0Z_0) \text{不成功} \end{cases}$$

$$\textcircled{2} \quad (q_2, 0010, Z_0) \vdash (q_3, 010, 0Z_0) \vdash (q_3, 10, 00Z_0) \vdash \begin{cases} (q_4, 0, 00Z_0) \vdash (q_4, \varepsilon, 00Z_0) \text{不成功} \\ (q_5, 0, 00Z_0) \vdash (q_6, \varepsilon, 0Z_0) \text{不成功} \end{cases}$$

$$\textcircled{3} \quad (q_4, 0010, 0Z_0) \vdash (q_4, 010, 0Z_0) \vdash (q_4, 10, 0Z_0) \vdash \begin{cases} (q_4, 0, 0Z_0) \vdash (q_4, \varepsilon, 0Z_0) \text{不成功} \\ (q_5, 0, 0Z_0) \vdash (q_6, \varepsilon, Z_0) \vdash \textcircled{q_8} \text{成功} \end{cases}$$

$$\textcircled{4} \quad (q_5, 0010, 0Z_0) \vdash (q_6, 010, 0Z_0) \vdash (q_6, 010, \varepsilon) \text{不成功}$$

$$(2) \quad (q_0, 100101001, Z_0) \vdash \begin{cases} (q_1, 100101001, Z_0) \vdash \begin{cases} (q_1, 00101001, Z_0) \vdash (q_1, 0101001, Z_0) \textcircled{1} \\ (q_2, 00101001, Z_0) \vdash (q_3, 0101001, 0Z_0) \textcircled{2} \end{cases} \\ (q_2, 100101001, Z_0) \text{不成功} \end{cases}$$

$$\textcircled{1} \quad (q_1, 0101001, Z_0) \vdash (q_1, 101001, Z_0) \vdash \begin{cases} (q_1, 01001, Z_0) \vdash (q_1, 1001, Z_0) \vdash \begin{cases} (q_1, 001, Z_0) \\ (q_2, 001, Z_0) \end{cases} \\ (q_2, 01001, Z_0) \vdash (q_3, 1001, 0Z_0) \vdash \begin{cases} (q_4, 001, 0Z_0) \\ (q_5, 001, 0Z_0) \end{cases} \end{cases}$$

$$\begin{aligned} & \vdash (q_1, 01, Z_0) \vdash (q_1, 1, Z_0) \vdash \begin{cases} (q_1, \varepsilon, Z_0) \text{不成功} \\ (q_2, \varepsilon, Z_0) \text{不成功} \end{cases} \\ \Rightarrow & \vdash (q_3, 01, 0Z_0) \vdash (q_3, 1, 00Z_0) \vdash \begin{cases} (q_4, \varepsilon, 00Z_0) \text{不成功} \\ (q_5, \varepsilon, 00Z_0) \text{不成功} \end{cases} \\ & \vdash (q_4, 01, 0Z_0) \vdash (q_4, 1, 0Z_0) \vdash \begin{cases} (q_4, \varepsilon, 0Z_0) \text{不成功} \\ (q_5, \varepsilon, 0Z_0) \text{不成功} \end{cases} \end{aligned}$$

$$\vdash (q_6, 01, Z_0) \vdash (q_6, 01, \varepsilon) \text{不成功}$$

$$\textcircled{2} \quad (q_3, 0101001, 0Z_0) \vdash (q_3, 101001, 00Z_0) \vdash \begin{cases} (q_4, 01001, 00Z_0) \vdash (q_4, 1001, 0Z_0) \vdash \begin{cases} (q_4, 001, 00Z_0) \\ (q_5, 001, 00Z_0) \end{cases} \\ (q_5, 01001, 00Z_0) \vdash (q_6, 1001, 0Z_0) \vdash (q_7, 001, 0Z_0) \end{cases}$$

$$\vdash (q_4, 01, 00Z_0) \vdash (q_4, 1, 00Z_0) \vdash \begin{cases} (q_4, \varepsilon, 00Z_0) \text{不成功} \\ (q_5, \varepsilon, 00Z_0) \text{不成功} \end{cases}$$

$$\Rightarrow \vdash (q_6, 01, 0Z_0) \vdash (q_6, 1, Z_0) \vdash \begin{cases} (q_6, 1, \varepsilon) \text{不成功} \\ (q_7, \varepsilon, Z_0) \vdash \textcircled{q_8} \text{成功} \end{cases}$$

$$\vdash (q_7, 01, 0Z_0) \vdash (q_7, 1, 0Z_0) \vdash (q_7, \varepsilon, 0Z_0) \text{不成功}$$

成功 $\textcircled{1} \quad (q_0, 010010, Z_0) \vdash (q_2, 010010, Z_0) \vdash (q_3, 10010, 0Z_0) \vdash$

$(q_4, 0010, 0Z_0) \vdash (q_4, 010, 0Z_0) \vdash (q_4, 10, 0Z_0) \vdash$

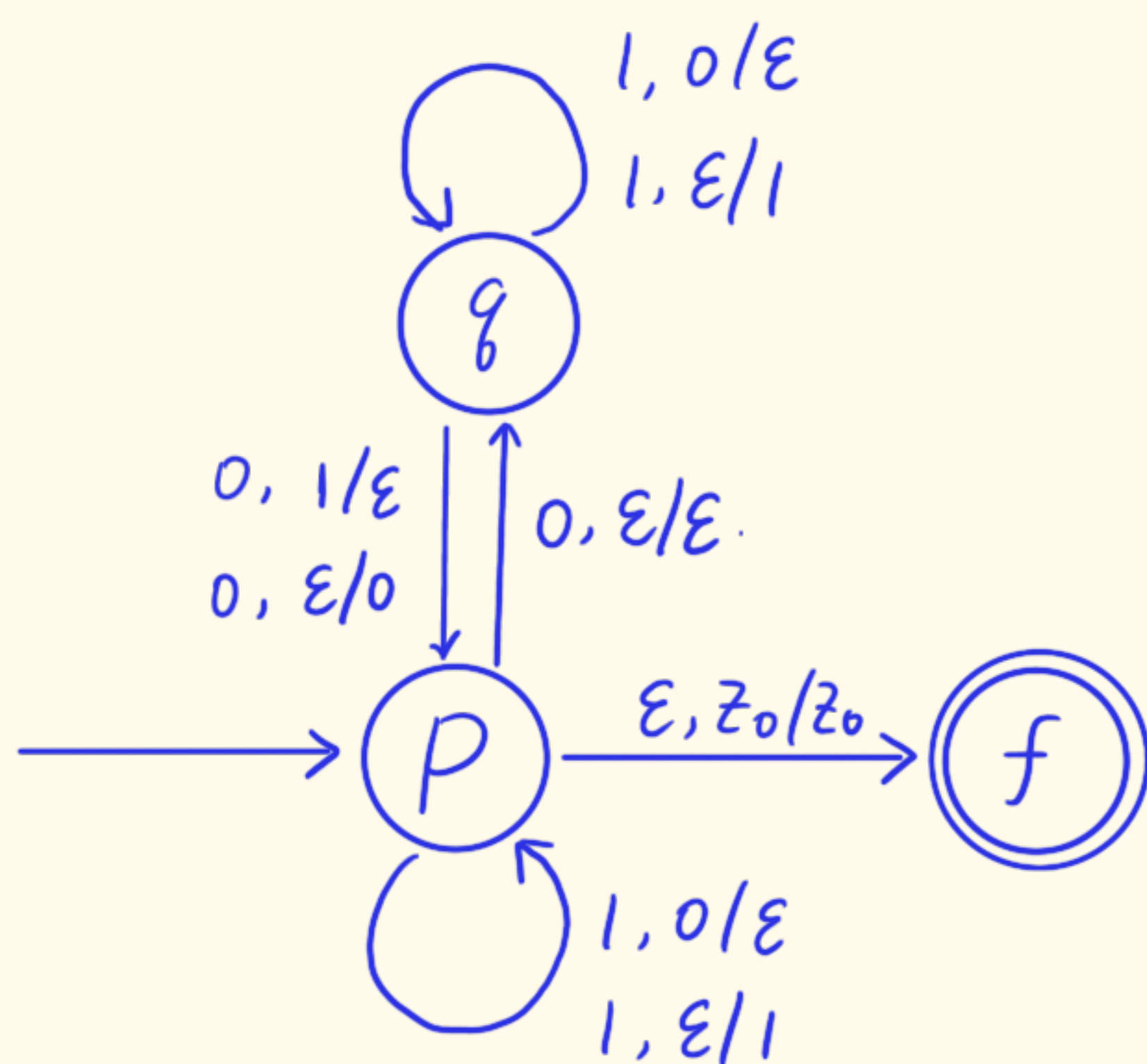
$(q_5, 0, 0Z_0) \vdash (q_6, \varepsilon, Z_0) \vdash (q_8)$

$(q_0, 100101001, z_0) \vdash (q_1, 100101001, z_0) \vdash$
 $(q_2, 00101001, z_0) \vdash (q_3, 0101001, 0z_0) \vdash$
 $(q_3, 101001, 00z_0) \vdash (q_4, 01001, 00z_0) \vdash$
 $(q_4, 1001, 00z_0) \vdash (q_5, 001, 00z_0) \vdash$
 $(q_6, 01, 0z_0) \vdash (q_6, 1, z_0) \vdash$
 $(q_7, \varepsilon, z_0) \vdash q_8.$

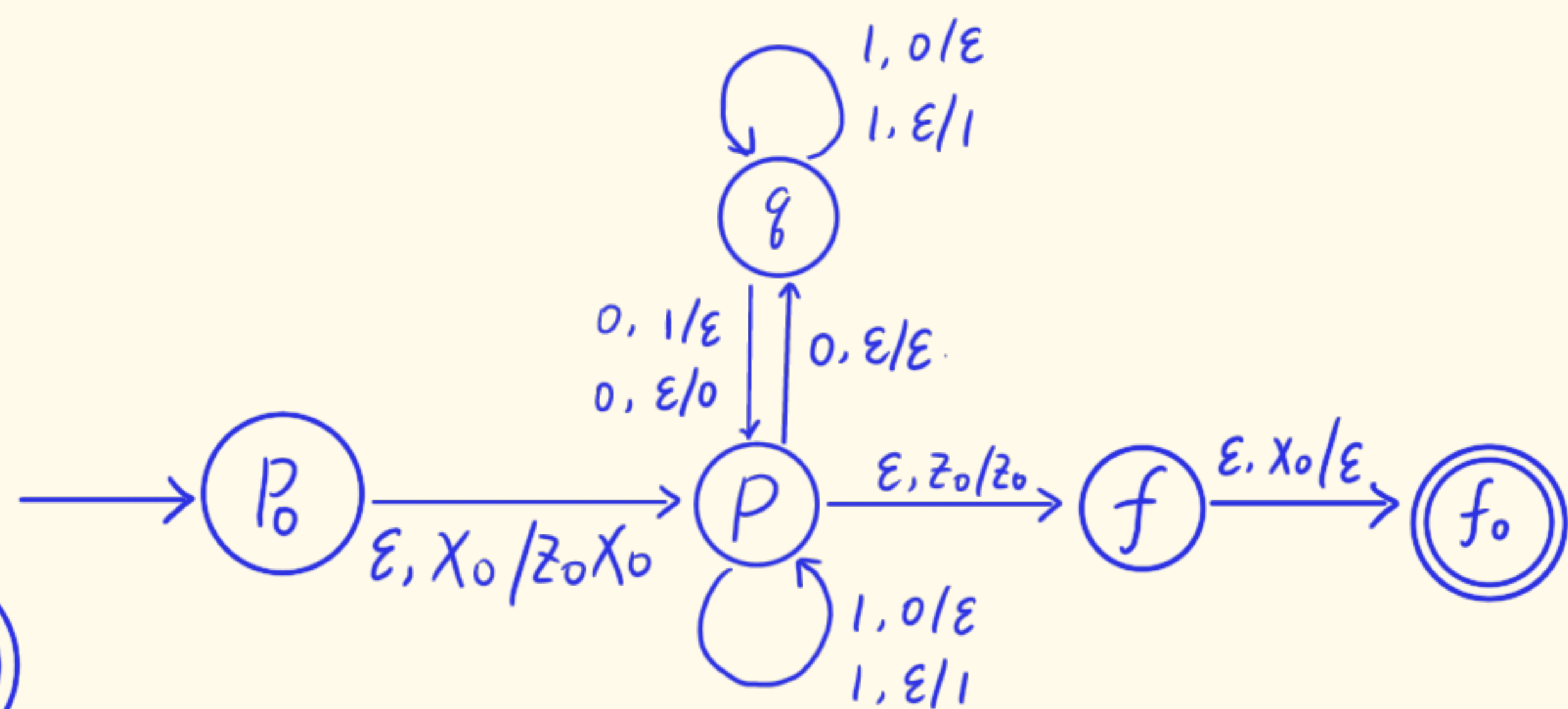
由于失败情况很多，一一穷举不太可能，如果能给出来正确路径，可以酌情给分。

7.2 (2).

① 以接受状态接受的 PDA

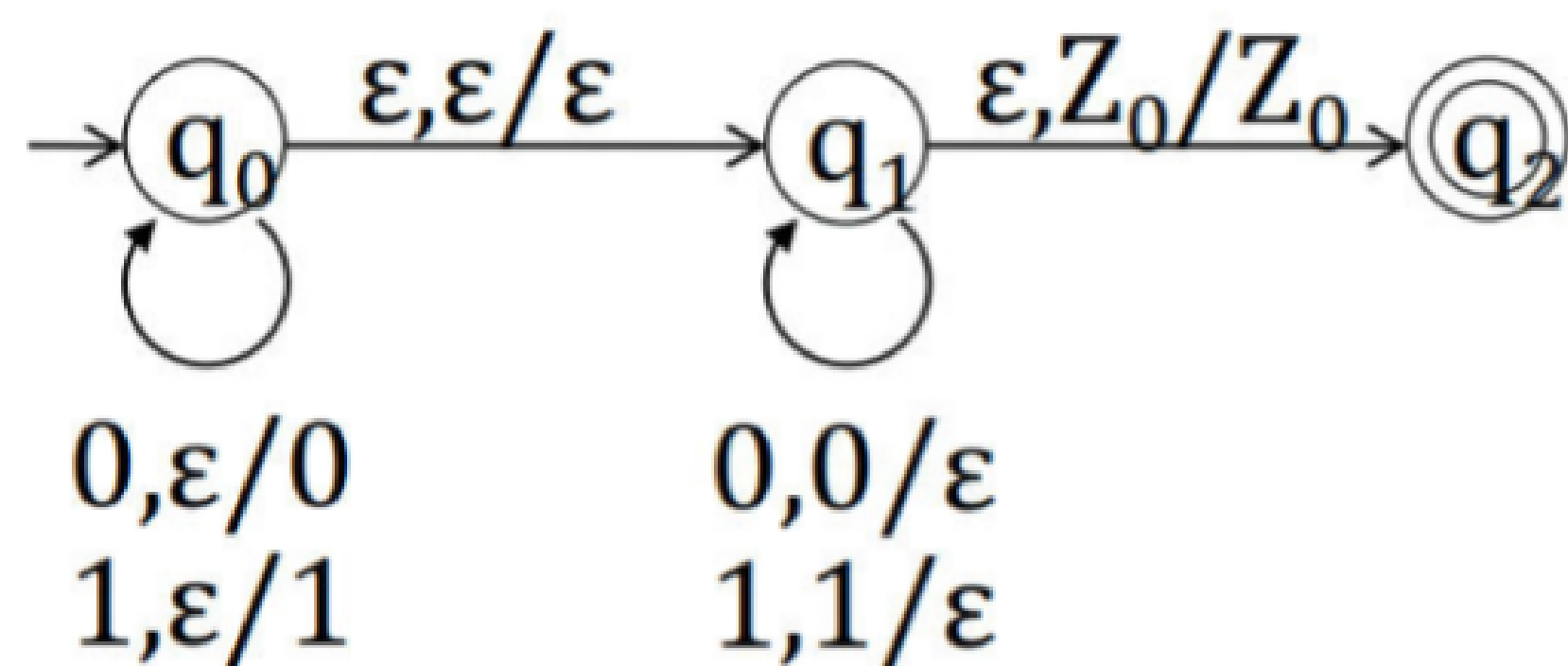


② 以空栈方式接受。



7.7 (1).

解：例 7.3 中的 PDA 如下



对于 q_0 ，转移函数有 $\delta(q_0, 0, \varepsilon)$

$\delta(q_0, 1, \varepsilon)$

$\delta(q_0, \varepsilon, \varepsilon)$

不满足 $\forall q \in Q, a \in \Sigma \cup \{\varepsilon\}, X \in \Gamma \cup \{\varepsilon\} \cdot \delta(q, a, X)$ 至多只有一个成员
该 PDA 不是确定型的。