

$$20) M = (\{q_0, q_1\}, \{a, b, c\}, \{A, B, K\}, \delta, q_0, K, \emptyset)$$

$$\begin{aligned} \delta(q_0, a, K) &= (q_0, AK) \checkmark & \delta(q_0, c, B) &= (q_1, B) \checkmark & \delta(q_1, \epsilon, K) &= (q_1, \epsilon) \checkmark \\ \delta(q_0, b, A) &= (q_0, BA) \checkmark & \delta(q_1, a, A) &= (q_1, \epsilon) \checkmark \\ \delta(q_0, a, B) &= (q_0, AB) \checkmark & \delta(q_1, b, B) &= (q_1, \epsilon) \checkmark \end{aligned}$$

$$S \rightarrow [q_0, K, q_0]$$

$$S \Rightarrow [q_0, K, q_1]$$

+ (1)

$$[q_0, K, q_0] \rightarrow a [q_0, A, q_0] [q_0, K, q_0]$$

$$[q_0, K, q_0] \rightarrow a [q_0, A, q_1] [q_1, K, q_0] \quad X$$

$$[q_0, K, q_1] \rightarrow a [q_0, A, q_0] [q_0, K, q_1]$$

$$[q_0, K, q_1] \rightarrow a [q_0, A, q_1] [q_1, K, q_1]$$

+ (2)

$$[q_0, A, q_0] \rightarrow b [q_0, B, q_0] [q_0, A, q_0]$$

$$[q_0, A, q_0] \rightarrow b [q_0, B, q_1] [q_1, A, q_0] \quad X$$

$$[q_0, A, q_1] \rightarrow b [q_0, B, q_0] [q_0, A, q_1]$$

$$[q_0, A, q_1] \rightarrow b [q_0, B, q_1] [q_1, A, q_1]$$

+ (3)

$$[q_1, K, q_0] \rightarrow \text{mrta} \quad (q_1 > q_0) \quad X$$

$$[q_1, K, q_1] \rightarrow \epsilon$$

+ (4)

$$[q_1, A, q_0] \rightarrow \text{mrta} \quad (q_1 > q_0) \quad X$$

$$[q_1, A, q_1] \rightarrow a$$

+ (5)

$$[q_0, B, q_0] \rightarrow a [q_0, A, q_0] [q_0, B, q_0]$$

$$[q_0, B, q_0] \rightarrow a [q_0, A, q_1] [q_1, B, q_0] \quad X$$

$$[q_0, B, q_1] \rightarrow a [q_0, A, q_0] [q_0, B, q_1]$$

$$[q_0, B, q_1] \rightarrow a [q_0, A, q_1] [q_1, B, q_1]$$

+ (6)

$$[q_0, B, q_0] \rightarrow c [q_0, B, q_0]$$

$$[q_0, B, q_1] \rightarrow c [q_0, B, q_1]$$

+ (7)

$$[q_1, B, q_1] \rightarrow b$$

+

(8)

=

$$[q_1, B, q_0] \rightarrow \text{mrta}$$

X