

Solution of HW#7

1.

a)

$$P = (\{q_0, q_1\}, \{a, b\}, \{c, Z_0\}, \delta, q_0, Z_0, \{q_1\})$$

Transition function

$$\delta(q_0, \varepsilon, Z_0) = \{(q_1, Z_0)\}$$

$$\delta(q_0, a, Z_0) = \{(q_0, cZ_0), (q_0, ccZ_0), (q_0, cccZ_0)\}$$

$$\delta(q_0, a, c) = \{(q_0, cc), (q_0, ccc), (q_0, cccc)\}$$

$$\delta(q_0, b, c) = \{(q_0, \varepsilon)\}$$

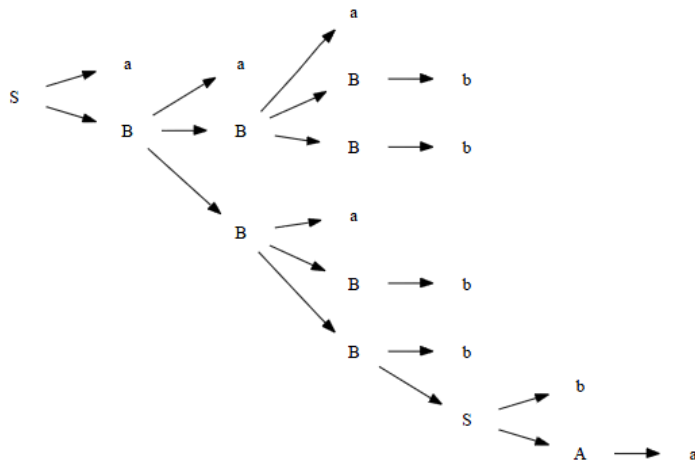
$$\delta(q_0, \varepsilon, Z_0) = \{(q_1, Z_0)\}$$

b)

$$\begin{aligned} \delta(q_0, aaabbbb, Z_0) \vdash \delta(q_0, aabbbbb, cZ_0) \vdash \delta(q_0, abbbbb, cccZ_0) \vdash \delta(q_0, bbbbb, ccccZ_0) \\ \vdash \delta(q_0, bbbb, ccccZ_0) \vdash \delta(q_0, bbb, cccZ_0) \vdash \delta(q_0, bb, ccZ_0) \vdash \delta(q_0, b, cZ_0) \\ \vdash \delta(q_0, \varepsilon, Z_0) \vdash \delta(q_1, \varepsilon, Z_0) \end{aligned}$$

2.

a)



b) $S \rightarrow aB$

$\rightarrow aaBB$

$\rightarrow aaaBBB$

$\rightarrow aaabBB$

$\rightarrow aaabbB$

- aaabbaBB
- aaabbabB
- aaabbabbS
- aaabbabbbA
- aaabbabbba

(여러 개의 Parse Tree가 생성되므로 유일하지 않다.)

- c) $S \rightarrow aB$
- aaBB
 - aaBbS
 - aaBbbA
 - aaBbba
 - aaaBBbba
 - aaaBbSbba
 - aaaBbaBbba
 - aaaBbabbbba
 - aaabbabbba