

Ch: 4

1) $S' \rightarrow S$

$S \rightarrow aS \mid bS \mid B$

$B \rightarrow bb \mid C \mid \lambda$

$C \rightarrow cC \mid \lambda$

Null

prev

$\{C, B\}$

$\{S, C, B\}$

$\{C, B\}$

$\{S', S, C, B\}$ $\{S, C, B\}$

$S' \rightarrow S \mid \lambda$

$S \rightarrow aS \mid bS \mid B \mid a \mid b$

$B \rightarrow bb \mid C$

$C \rightarrow cC \mid c$

$a^* b^* (bb \cup c^*)$

7) $S \rightarrow AS \mid A$

$A \rightarrow aA \mid bB \mid C$

$B \rightarrow bB \mid b$

$C \rightarrow cC \mid B$

$\text{chain}(S) = \{S, A, C, B\}$

$A = \{A, C, B\}$

$B = \{B\}$

$C = \{C, B\}$

$S \rightarrow AS \mid aA \mid bB \mid cC \mid bB \mid b$

$A \rightarrow aA \mid bB \mid cC \mid bB \mid b$

$B \rightarrow bB \mid b$

$C \rightarrow cC \mid bB \mid b$

$a^* b^* c^* b^+$

14) $S \rightarrow AA \mid CD \mid bB$

$A \rightarrow aA \mid a$

$B \rightarrow bB \mid bC$

$C \rightarrow cB$

$D \rightarrow dD \mid d$

Term

Prev

$\{D, A\}$

$\{S, D, A\}$

$\{S, D, A\}$

$\{D, A\}$

$\{S, D, A\}$

$S \rightarrow AA$

$A \rightarrow aA \mid a$

$D \rightarrow dD \mid d$

$S \rightarrow AA$

$A \rightarrow aA \mid a$

Reach

Prev

New

S

S, A

S, A

S

S, A

S

A

23/ $S \rightarrow A|ABa|AbA$

$A \rightarrow aA|\lambda$

$B \rightarrow Bb|BC$

$C \rightarrow CB|CA|bB$

Null

Prev

$\{A\}$

$\{S, A\}$

$\{S, A\}$

$\{A\}$

$\{S, A\}$

$S \rightarrow A|ABa|AbA|Ba|b|\lambda$

$A \rightarrow aA|a$

$B \rightarrow Bb|BC$

$C \rightarrow CB|CA|bB$

chain (S) = $\{S, A\}$

$A = \{A\}$

$B = \{B\}$

$C = \{C\}$

$S \rightarrow aA|a|ABa|AbA|Ba|b|\lambda$

$A \rightarrow aA|a$

$B \rightarrow Bb|BC$

$C \rightarrow CB|CA|bB$

Term

Prev

$\{A, S\}$

$\{A, S\}$

$\{A, S\}$

$S \rightarrow aA|a|AbA|b|\lambda$

$A \rightarrow aA|a$

$S \rightarrow A'A|AT_1|a|b|\lambda$

$T_1 \rightarrow B'A$

$A' \rightarrow a$

$B' \rightarrow b$

$A \rightarrow A'A|a$

| | | | | |
|-----|---|---|---|---|
| 26/ | b | a | a | a |
| | B | A | A | A |
| | - | X | X | = |
| | - | - | - | - |

| | | | | |
|---|---|---|---|---|
| a | b | a | a | a |
| A | B | A | A | A |
| S | - | X | X | - |
| - | - | - | X | - |
| - | - | - | - | - |

32/ $S \rightarrow AB | BC$
 $A \rightarrow AB | a$
 $B \rightarrow AA | CB | b$
 $C \rightarrow a | b$

$S \rightarrow AB | BC$
 $A \rightarrow aR_1 | a$
 $B \rightarrow AA | CB | b$
 $C \rightarrow a | b$
 $R_1 \rightarrow BR_1 | B$

$S \rightarrow AB | BC$
 $A \rightarrow aR_1 | a$
 $B \rightarrow aR_1A | aA | CB | b$
 $C \rightarrow a | b$
 $R_1 \rightarrow BR_1 | B$

$S \rightarrow aR_1B | aB | aR_1AC | aAC | aBC | bBC | bC$
 $A \rightarrow aR_1 | a$
 $B \rightarrow aR_1A | aA | aB | bB | b$
 $C \rightarrow a | b$
 $R_1 \rightarrow BR_1 | B$

$S \rightarrow aR_1B | aB | aR_1AC | aAC | aBC | bBC | bC$
 $A \rightarrow aR_1 | a$
 $B \rightarrow aR_1A | aA | aB | bB | b$
 $C \rightarrow a | b$
 $R_1 \rightarrow aR_1AR_1 | aAR_1 | aBR_1 | bBR_1 | bR_1 | aR_1A | aA | aB | bB | b$