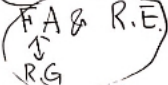
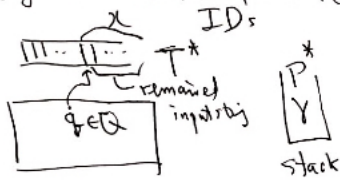


1/9 7/1778 Equivalence of CFG's & PDA's - chap 6 - Type 2 lang.

" FA & R.E. - chap 3 - Type 3 lang



### Configurations (Instantaneous Descriptions) of PDA

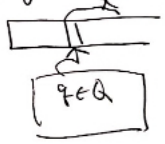


$$Q \times \Sigma^* \times P^* \ni [q, x, Y]$$

current state, remained input string, current stack contents

$$[q, \alpha x, X\beta] \vdash [p, \alpha, Y\beta] \text{ if } (p, \alpha) \in \delta(q, \alpha, X)$$

### Configuration of FA

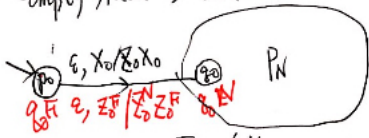


current state, remained input string

$$[q, x, Y] \vdash [p, Y] \text{ if } p \in \delta(q, x)$$

See Thm 6.3 & 6.6 in text p233, TP pb. rewrites : rewriting systems.

Thm 6.9 Empty stack  $\Rightarrow$  Final state



Thm 6.11 Final state  $\Rightarrow$  Empty stack

6.3 Equivalence of PDA's and CFG's

6.3.1 CFG  $\Rightarrow$  PDA : Guess and verify Parser  $\leftrightarrow$  Left Parser (L.P.)

6.3.2 PDA  $\Rightarrow$  CFG : Thm 6.13

guess A  $A \rightarrow \alpha \in P$

$$[q, \alpha, A] \vdash_L [q, \epsilon, \epsilon]$$

reduce  $\alpha$  to A  $A \rightarrow \alpha \in P$

$$(\epsilon, \alpha^R) \vdash_R (\epsilon, A)$$

verify  $\alpha \in T$

$$[q, \alpha, a] \vdash_L [q, \epsilon, \epsilon]$$

$$[q, \alpha, \epsilon] \vdash_R (\epsilon, a)$$

shift  $\alpha$  a  $\alpha \in T$

Guess & Verify Parser  
Left Parser (L.P.)  
Right Parser - yacc (R.P.)  
Shift & Reduce Parser