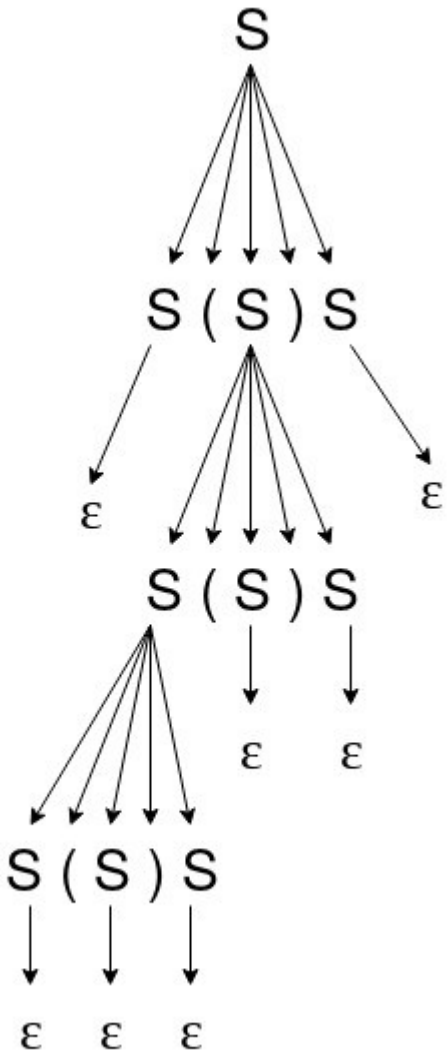
4.2.2.c

S → S (S) S
| ε
String: (( ) ( ))

Left most parse:
S → S (S) S
→ ε (S) S
→ (S (S) S) S
→ (S (S) S (S) S) S
→ (ε (S) S (S) S) S
→ ((ε) S (S) S) S
→ (( ) ε (S) S) S
→ (( ) (ε) S) S
→ (( ) ( ) ε) S
→ (( ) ( )) ε
→ (( ) ( ))

Right mose Parse:
S → S (S) S
→ S (S) ε→ S (S (S) S)
→ S (S (S (S) S) S)
→ S (S (S) S (S) ε)
→ S (S (S) S (ε))
→ S (S (S) ε ( ))
→ S (S (ε) ( ))
→ S (ε ( ) ( ))
→ ε (( ) ( ))
→ (( ) ( ))

Parse Tree:



The grammer is ambigous since with the input (()()), we can create two different parse trees with the same grammer.

The Language generates parentheses where every left parentheses closes with a right parentheses.

4.2.3.a

S → 1 S
| 01 S
| ε

4.4.1.c

S → S (S) S
| ε

$S \rightarrow S_R$

$S_R \rightarrow (S) S S_R$
$\quad\quad | \ \varepsilon$

First (S) = { (, ε) }

First (S_R) = { (, ε }

Folow (S) = {), (, $ }

Follow (S_R) = {), (, $ }

	(	)	$
S	$S \rightarrow S_R$	$S \rightarrow S_R$	$S \rightarrow S_R$
S_R	$S_R \rightarrow (S) S S_R$	$S_R \rightarrow \varepsilon$	$S_R \rightarrow \varepsilon$