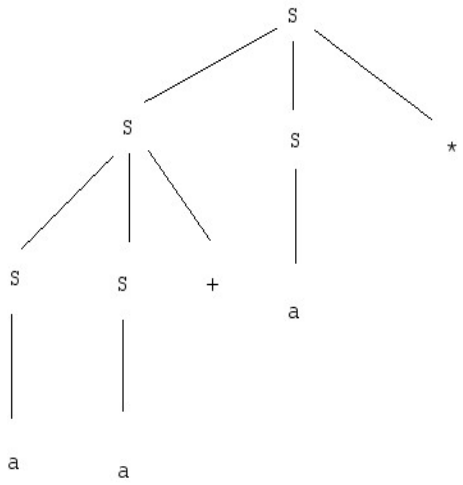
2.2.1

a.

S
=> SS*
=> SS+S*
=> SS+a*
=> Sa+a*
=> aa+a*

b.

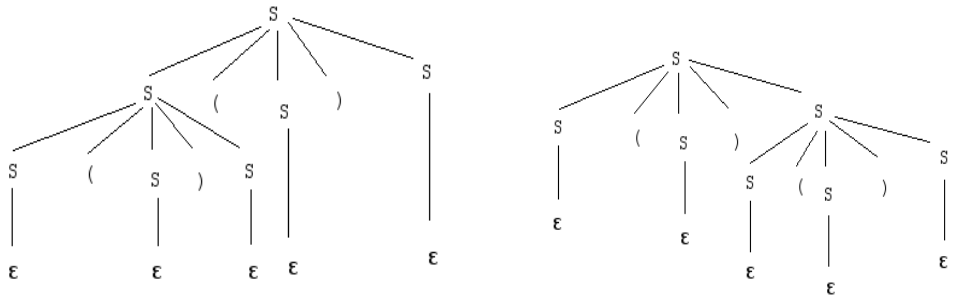


c.

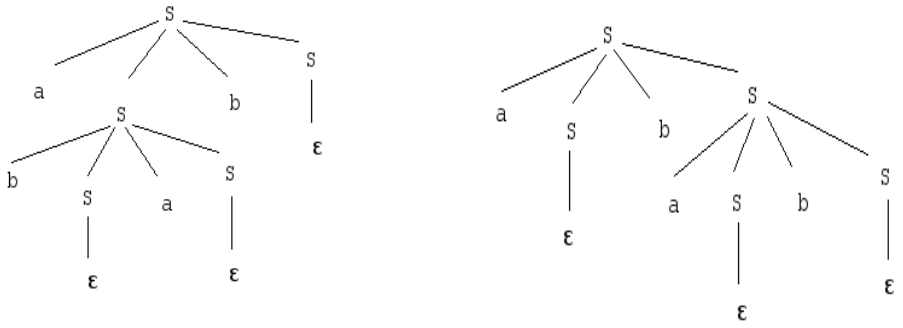
The grammar generated by this language is a series of postfix operations consisting only of addition and multiplication.

2.2.3

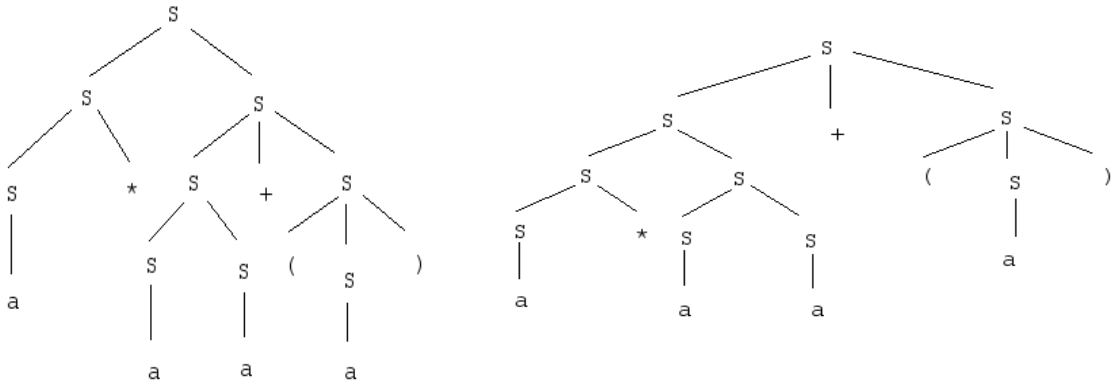
c. String: ()() can be parsed multiple ways



d. String: *abab* can be parsed multiple ways.



e. String: a*aa+(a) can be parsed multiple ways.



2.2.4

a.

S → *S S* + | *S S* - | *S S* / | *S S* * | x

b.

S → *identifier , terminal* | *terminal*
identifier → *identifier , terminal* | *terminal*
terminal → a

c.

S → *terminal , identifier*
identifier → *terminal , identifier* | *terminal*
terminal → a

d.

S → *identifier operator identifier*
identifier → *integer operator identifier* | *integer*
operator → + | - | * | /
integer → 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9