**4.1** *Give context-free grammars generating the following sets*

1. The set of palindromes (strings that read the same forward as backward) over alphabet (a,b)

***G= (N, T, S, P)***

***N = {S}***

***T= {a,b}***

***S = S (Simbolo inicial)***

***P = {S -> aSa, bSb,***

***S-> a***

***S-> b***

***S-> Σ }***

1. The set of all strings of balanced parentheses, i.e.. each left parenthesis has a matching right parenthesis and pairs of matching parentheses are properly nested.

***G= (N, T, S, P)***

***N = {S}***

***T= {(,), ()}***

***S = S***

***P = { S -> ? | SS | (S) }***

***4.8*** *Let G be the gramar*

***S-> aB|bA***

***A-> a|aS|bAA***

***B->b|bS|aBB***

1. leftmost derivation.
2. rightmost derivation.
3. Parse tree.