**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 over alphabet {a, b} with exactly twice as many a´s and b´s.

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

***N = {S}***

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

***P = { S -> SaSbSaS,***

***S -> SaSaSbS***

***S -> SbSaSaS***

***S -> Σ }***

***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.