① GIC_1= ({S} , {a,b} , S,P)

Palíncromos

$S \longrightarrow$ a 1 2 | b 3 4 | a | b | | a m b d

$S \longrightarrow$ a S a | b S b | a | b | λ

② $L = \{ a^i b^j c^k \mid i = j \text{ o } j = k, i, j, k > 0 \}$

$S \longrightarrow$ XC | AY

$C \longrightarrow$ Cc | c

$A \longrightarrow$ aAl a

$X \longrightarrow$ aXb | ab

$Y \longrightarrow$ bYc | bc

③ $L = \{ a^i b^i \ a^j b^j \mid i, j > 0 \}$

$S \longrightarrow$ XX

$X \longrightarrow$ aXb | b

④ $L = \{ a^i b^j c^k \mid k = i + 2j, \ i, j, k \geq 0$

$S \rightarrow a S c \mid X$

$X \rightarrow b X c c \mid \lambda$

⑤ $N(a) = 2 N(b)$ aba   aab   baa λ

$S \rightarrow a S a S b S \mid a S b S a S \mid b S a S a S \mid \lambda$

⑥ $N(0) = N(1) + 1$ $01\overset{\downarrow}{0}$ 10

$S \rightarrow A 0 A$

$A \rightarrow 0 A 1 A 1 \mid 1 A 0 A \mid \lambda$

⑦ $L = \{ a^i (b + c)^k \mid k > i, \ i \geq 0 \}$

$S \rightarrow a S S \mid a S c \mid S b \mid S c \mid b \mid c$

(8) $L = \{a^i b^j c^k \mid k = |i - j|, \quad i, j, k \geq 0\}$

$S \to X \mid Y Z$

$X \to a X c \mid \lambda$

$Y \to a Y b \mid \lambda$

$Z \to b Z c \mid \lambda$

(9) $L = \{a^i (b+c)^j d^k \mid i + k > j, \quad i, j, k \geq 0\}$

$S \to {}_a A X Y D \mid A X Y d D$

$X \to a X b \mid a X c \mid \lambda$

$Y \to b Y d \mid c Y d \mid \lambda$

$A \to a A \mid \lambda$

$D \to d D \mid \lambda$

(10) $N(c) = N(a) + N(b)$

$S \to S Y S c \mid c S Y S \mid \lambda$

$Y \to a \mid b$