1. $L(G) = \{0,1,2,3,4,5,6,7,8,9\}^+$

对于句子000，最左推导：

$N \Rightarrow ND \Rightarrow NDD \Rightarrow DDD \Rightarrow 0DD \Rightarrow 00D \Rightarrow 000$

最右推导：

$N \Rightarrow ND \Rightarrow N0 \Rightarrow NDO \Rightarrow N00 \Rightarrow D00 \Rightarrow 000$

2. G_1：2型. $L(G_1) = \{a0^n \mid n \geq 0 \cup b0^{2n} \mid n \geq 0\}$

G_2：2型. $L(G_2) = \{a^n c b^n \mid n \geq 0\}$

G_3：3型. $L(G_3) = \{a^{2n+1} \mid n \geq 0\}$

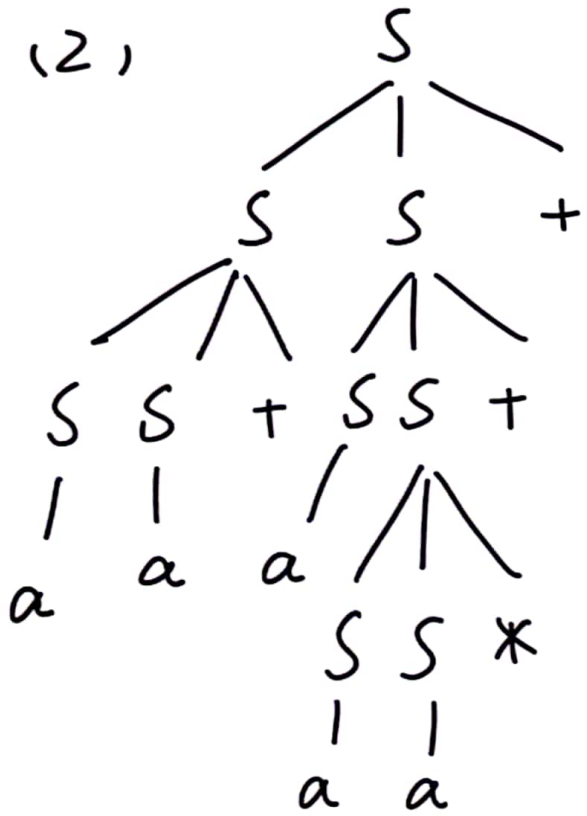
3. (1) $(10|01)^+$

(2) 101010、101001、100110、100101、

011010、011001、010110、010101

4. (1) $1

(2)



(3)

$L(G(S))$ = {以a作为运算对象，包含+和*运算符的逆波兰表达式}

5. (1) 对于G(N)有：$N \Rightarrow E \Rightarrow 0$

$N \Rightarrow D \Rightarrow 0$

对于G(S)有：$S \Rightarrow S(S)S \Rightarrow S(S)S(S)S \Rightarrow ()()$

$S \Rightarrow S(S)S \Rightarrow S(S)S(S)S \Rightarrow ()()$

(2) $G(N)$：$N \rightarrow ND \mid D$

$D \rightarrow 0 \mid 1 \mid 2 \mid \cdots \mid 9$

$G(S)$：$S \rightarrow S(S) \mid \varepsilon$

6.(1) $S \to aBa$

$B \to bB \mid \varepsilon$

(2) $S \to Sc \mid D$

$D \to aDb \mid ab$

(3) $S \to Sb \mid D$

$D \to ab \mid aDb$

(4) $S \to AA$

$A \to aAb \mid \varepsilon$

(5) $S \to aSb \mid A$

$A \to bAa \mid \varepsilon$

(6)

$S \to a \mid b \mid c \mid aSa \mid bSa \mid cSc \mid \varepsilon$