

Zad. 6

1) $L = \{0^n 1^m 0^n \mid n, m \in \mathbb{N}\}$

$$G = \langle \Sigma, V, S, P \rangle$$

$$V = \{S, T\} \quad \Sigma = \{0, 1\}$$

$$P = \{S \mapsto \varepsilon \mid 0S0 \mid T, T \mapsto 1T \mid \varepsilon\}.$$

2) $L = \{0^n 1^m 0^m, n, m \in \mathbb{N}\}$

$$\Sigma = \{0, 1\} \quad V = \{S, T\}$$

$$P = \{S \mapsto \varepsilon \mid S0 \mid T, T \mapsto 0S1 \mid \varepsilon\}.$$

3) $L = \{0^m 1^m 0^k, m, k \in \mathbb{N}, m \leq k\}$

$$P = \left\{ \begin{aligned} &S \mapsto \varepsilon \mid S0 \mid T, T \mapsto \varepsilon \mid T1 \mid U \\ &U \mapsto \varepsilon \mid 0U1 \end{aligned} \right\}$$

$$V = \{S, U, T\} \quad \Sigma = \{0, 1\}$$

4) $L = \{(01)^m 0^{2n}, n \in \mathbb{N}\} = \{(01)^m (00)^n, n \in \mathbb{N}\}$

$$G = (\Sigma, V, S, P) \quad V = \{S\}.$$

$$P = \{S \mapsto \varepsilon \mid 01S00\}.$$

5) $L = \{w \in \{0, 1\}^* \mid \#1 = \#0\}$

$$P = \{S \mapsto \varepsilon \mid 0S1 \mid 01S \mid 1S0 \mid 10S \mid 1S0 \mid S10\}.$$

6) $L = \{w \in \{0, 1\}^* \mid \#1 = 2 \cdot \#0\}$

$$P = \{S \mapsto \varepsilon \mid 001S \mid 010S \mid 100S \mid S001 \mid S010 \mid S100 \mid 0S10 \mid 0S01 \mid 1S00 \mid 10S0 \mid 01S0 \mid 00S1\}$$