

۱- منظم یا نا منظم بودن زبان های زیر را مشخص و پاسخ خود را اثبات کنید .

$$L_1 = \{xy : x, y \in \{0,1\}^*, \text{ and } \#_0(x) = \#_0(y)\}.$$

$$L_2 = \{xy : x, y \in \{0,1\}^*, \text{ and } \#_0(x) = \#_1(y)\}.$$

$$L_3 = \{x2y : x, y \in \{0,1\}^*, \text{ and } \#_0(x) = \#_1(y)\}.$$

$$L_4 = \{a^i b^j c^k : i, j, k \geq 0, \text{ and } i + j = k\}.$$

$$L_5 = \{w \in \{0,1\}^* : w \text{ contains an equal number of occurrences of the substrings } 01 \text{ and } 10\}.$$

$$L_6 = \text{ is the set of binary representations of all non-negative integers which are the powers of } 4.$$

$$L_7 = \{ww^R x : w \in \{a,b\}^*, x \in \{a,b\}^*\}.$$

$$L_8 = \{ww^R x : w \in \{a,b\}^+, x \in \{a,b\}^*\}.$$

$$L_9 = \{w \in \{0,1\}^* : \#_0(w) \neq \#_1(w)\}.$$

$$L_{10} = \{w : \exists y \in \{a\}^* w = yy\}.$$

$$L_{11} = \{w \in \{a,b\}^* : \forall x \in \{a,b\}^*, xw = w\}.$$

$$L_{12} = \{xyx : x, y \in \{a,b\}^*\}.$$

$$L_{13} = \{xyx : x, y \in \{a,b\}^+\}.$$

$$L_{14} = \{xyx^R : x, y \in \{a,b\}^*\}.$$

$$L_{15} = \{xyx^R : x, y \in \{a,b\}^+\}.$$

$$L_{16} = \{xyz y^R x : x, y, z \in \{a,b\}^*\}.$$

$$L_{17} = \{a^i b^j : 0 \leq i < j < 2^{1385}\}.$$

$$L_{18} = \{w1^n : w \in \{a,b\}^* \text{ and } |w| = n\}.$$

$$L_{19} = \{w : w \in \{a,b\}^* \text{ and there are two } 0\text{'s in } w \text{ that are separated by } 3i \text{ } 1\text{'s for some } i \geq 0\}.$$

$$L_{20} = \{a^n b^m : n + m \equiv_3 2\}.$$

$$L_{21} = \{xwx^R : x, y \in \{0,1\}^* \text{ and } |x|, |w| > 0\}.$$

$$L_{22} = \{L_a L_c L_b : L_a = a^*, L_b = b^*, L_c = a^n b^n\}.$$

$$L_{23} = \{a^{2^n} : n > 0\}.$$

$$L_{24} = \{a^{n^2} : n > 0\}.$$

$$L_{25} = \{a^m b^n : m \bmod n = 0\}.$$

$$L_{26} = \{ab^n c^m a^k : m, n > 0, k > \min(n, m)\}.$$

$$L_{27} = \{ab^n c^m a^k : m, n > 0, k > \max(n, m)\}.$$

$$L_{28} = \left\{ \sum_{i=1}^{50} L_i + \sum_{j=51}^{100} L_j : L_i \text{ is regular, } L_j \text{ is finite} \right\}.$$

$$L_{29} = \{L^* \cup \bar{L} : L = a^n b^n a^* b^*\}.$$

موفق باشید.

طلعتیان