برای زبان های مستقل از متن یک ماشین پشته ای طراحی کنید.

1- $l = \{a^n b^{2n} \mid n > 1\}$ جواب:

$$\delta : (q_0, a, z) \rightarrow (q_0, 11z)$$
$$\delta : (q_0, a, 1) \rightarrow (q_0, 111)$$
$$\delta : (q_0, b, 1) \rightarrow (q_1, \lambda)$$
$$\delta : (q_1, b, 1) \rightarrow (q_1, \lambda)$$
$$\delta : (q_1, \lambda, z) \rightarrow (q_f, z)$$

2- $l = \{wcw^R \mid w \in (a \mid b)^*\}$ جواب:

$$\delta : (q_0, a, z) \rightarrow (q_0, 1z)$$
$$\delta : (q_0, b, z) \rightarrow (q_0, 0z)$$
$$\delta : (q_0, a, 1) \rightarrow (q_0, 11)$$
$$\delta : (q_0, a, 0) \rightarrow (q_0, 10)$$
$$\delta : (q_0, b, 1) \rightarrow (q_0, 01)$$
$$\delta : (q_0, b, 0) \rightarrow (q_0, 00)$$
$$\delta : (q_0, c, 1) \rightarrow (q_1, 1)$$
$$\delta : (q_0, c, 0) \rightarrow (q_1, 0)$$
$$\delta : (q_1, a, 1) \rightarrow (q_1, \lambda)$$
$$\delta : (q_1, b, 0) \rightarrow (q_1, \lambda)$$
$$\delta : (q_1, \lambda, z) \rightarrow (q_f, z)$$

3- $l = \{a^n b^m c^{n+m} \mid n, m \geq 1\}$ جواب:

$$\delta : (q_0, a, z) \rightarrow (q_0.1z)$$
$$\delta : (q_0, a, 1) \rightarrow (q_0.11)$$
$$\delta : (q_0, b, 1) \rightarrow (q_1.11)$$
$$\delta : (q_1, b, 1) \rightarrow (q_1.11)$$
$$\delta : (q_1, c, 1) \rightarrow (q_2.\lambda)$$
$$\delta : (q_2, c, 1) \rightarrow (q_2.\lambda)$$
$$\delta : (q_2, \lambda, z) \rightarrow (q_f.z)$$

4- $l = \{a^3 b^n c^n \mid n \geq 1\}$ جواب:

$$\delta : (q_0, a, z) \rightarrow (q_1, z)$$
$$\delta : (q_1, a, z) \rightarrow (q_2, z)$$
$$\delta : (q_2, a, z) \rightarrow (q_3, z)$$
$$\delta : (q_3, b, z) \rightarrow (q_3, 1z)$$
$$\delta : (q_3, b, 1) \rightarrow (q_3, 11)$$
$$\delta : (q_3, c, 1) \rightarrow (q_4, \lambda)$$
$$\delta : (q_4, c, 1) \rightarrow (q_4, \lambda)$$
$$\delta : (q_4, \lambda, z) \rightarrow (q_f, z)$$

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$l = \{n_a(w) = n_b(w) \mid w \in (a \mid b)^*\}$ **-5**

جواب:
$$\delta : (q_0, a, z) \rightarrow (q_0, 1z)$$
$$\delta : (q_0, b, z) \rightarrow (q_0, 0z)$$
$$\delta : (q_0, a, 1) \rightarrow (q_0, 11)$$
$$\delta : (q_0, b, 0) \rightarrow (q_0, 00)$$
$$\delta : (q_0, a, 0) \rightarrow (q_0, \lambda)$$
$$\delta : (q_0, b, 1) \rightarrow (q_0, \lambda)$$
$$\delta : (q_0, \lambda, z) \rightarrow (q_f, z)$$

$l = \{a^n b^m \mid m = n, m = 2n, m = 3n\}$ **-6**

جواب:
$$\delta : (q_0, a, z) \rightarrow (q_1, 1z)$$
$$\delta : (q_1, a, 1) \rightarrow (q_1, 11)$$
$$\delta : (q_0, a, z) \rightarrow (q_2, 11z)$$
$$\delta : (q_2, a, 1) \rightarrow (q_2, 111)$$
$$\delta : (q_0, a, z) \rightarrow (q_3, 111z)$$
$$\delta : (q_3, a, 1) \rightarrow (q_3, 1111)$$
$$\delta : (q_1, b, 1) \rightarrow (q_4, \lambda)$$
$$\delta : (q_2, b, 1) \rightarrow (q_4, \lambda)$$
$$\delta : (q_3, b, 1) \rightarrow (q_4, \lambda)$$
$$\delta : (q_4, b, 1) \rightarrow (q_4, \lambda)$$
$$\delta : (q_4, \lambda, z) \rightarrow (q_f, z)$$

$l = \{ww^R\}, \Sigma = \{a, b\}$ **-7**

جواب:
$$\delta : (q_0, a, z) \rightarrow (q_0, 1z)$$
$$\delta : (q_0, b, z) \rightarrow (q_0, 0z)$$
$$\delta : (q_0, a, 1) \rightarrow (q_0, 11)$$
$$\delta : (q_0, a, 0) \rightarrow (q_0, 10)$$
$$\delta : (q_0, b, 0) \rightarrow (q_0, 00)$$
$$\delta : (q_0, b, 1) \rightarrow (q_0, 01)$$
$$\delta : (q_0, \lambda, 1) \rightarrow (q_1, 1)$$
$$\delta : (q_0, \lambda, 0) \rightarrow (q_1, 0)$$
$$\delta : (q_1, a, 1) \rightarrow (q_1, \lambda)$$
$$\delta : (q_1, b, 0) \rightarrow (q_1, \lambda)$$
$$\delta : (q_1, \lambda, z) \rightarrow (q_f, z)$$

$n_a(w) + n_b(w) = n_c(w), \Sigma = (a \mid b \mid c)^*$ **-8**

جواب:
$$\delta : (q_0, a, z) \rightarrow (q_0, 1z)$$
$$\delta : (q_0, b, z) \rightarrow (q_0, 1z)$$
$$\delta : (q_0, c, z) \rightarrow (q_0, 0z)$$
$$\delta : (q_0, c, 0) \rightarrow (q_0, 00)$$
$$\delta : (q_0, c, 1) \rightarrow (q_0, \lambda)$$
$$\delta : (q_0, a, 1) \rightarrow (q_0, 11)$$
$$\delta : (q_0, b, 1) \rightarrow (q_0, 11)$$
$$\delta : (q_0, a, 0) \rightarrow (q_0, \lambda)$$
$$\delta : (q_0, b, 0) \rightarrow (q_0, \lambda)$$
$$\delta : (q_0, \lambda, z) \rightarrow (q_f, z)$$

$\delta : (q_0, a, z) \rightarrow (q_0, 1z)$

$\delta : (q_0, a, 1) \rightarrow (q_0, 11)$

$\delta : (q_0, b, 1) \rightarrow (q_1, \lambda)$

$\delta : (q_0, b, z) \rightarrow (q_1, 0z)$

$\delta : (q_1, b, 1) \rightarrow (q_1, \lambda)$

$\delta : (q_1, b, z) \rightarrow (q_1, 0z)$:جواب $l = \{a^n b^{n+m} c^m \mid n \geq 0, m \geq 1\}$ **9-**

$\delta : (q_1, b, 0) \rightarrow (q_1, 00)$

$\delta : (q_1, c, 0) \rightarrow (q_2, \lambda)$

$\delta : (q_2, c, 0) \rightarrow (q_2, \lambda)$

$\delta : (q_2, \lambda, z) \rightarrow (q_f, z)$

$\delta : (q_0, a, z) \rightarrow (q_1, z)$

$\delta : (q_1, a, z) \rightarrow (q_1, 11z)$

$\delta : (q_1, a, 1) \rightarrow (q_1, 111)$

$\delta : (q_1, b, 1) \rightarrow (q_2, \lambda)$:جواب $l = \{a^{n+1} b^{2n} \mid n \geq 0\}$ **10-**

$\delta : (q_2, b, 1) \rightarrow (q_2, \lambda)$

$\delta : (q_2, \lambda, z) \rightarrow (q_f, z)$

$\delta : (q_0, a, z) \rightarrow (q_0, 1z)$

$\delta : (q_0, a, 1) \rightarrow (q_0, 11)$

$\delta : (q_0, b, 1) \rightarrow (q_1, 1)$

$\delta : (q_1, b, 1) \rightarrow (q_1, 1)$:جواب $l = \{a^n b^m c^n \mid n, m \geq 1\}$ **11-**

$\delta : (q_1, c, 1) \rightarrow (q_2, \lambda)$

$\delta : (q_2, c, 1) \rightarrow (q_2, \lambda)$

$\delta : (q_2, \lambda, z) \rightarrow (q_f, z)$

پایان جلسه هفتم