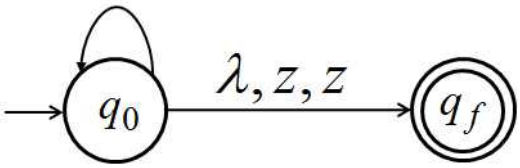
Review 20

Automata & Theory of Computation

Student ID: **Name:**

1. Answer the questions about the following transition graph.

$a,0,00$, $b,1,11$
$a,z,0z$, $b,0,\lambda$
$b,z,1z$, $a,1,\lambda$



(1) Construct a transition function.

$\delta(q_0, a, 0) = \{\square\}$, $\delta(q_0, b, 1) = \{\square\}$,
$\delta(q_0, a, z) = \{\square\}$, $\delta(q_0, b, 0) = \{\square\}$,
$\delta(q_0, b, z) = \{\square\}$, $\delta(q_0, a, 1) = \{\square\}$,
$\delta(q_0, \lambda, z) = \{\square\}$.

(2) Show that it accepts the string baab.

$(q_0, baab, z) \vdash (\square)$
$\vdash (\square)$
$\vdash (\square)$
$\vdash (\square)$
$\vdash (\square)$

2. Answer the questions about the following npda for the language $L = \{ww^R : w \in \{a,b\}^+\}$.

$$M = (Q, \Sigma, \Gamma, \delta, q_0, z, F)$$
$$Q = \{q_0, q_1, q_2\},$$
$$\Sigma = \{a, b\},$$
$$\Gamma = \{a, b, z\},$$
$$F = \{q_2\},$$

(1) Fill in the blanks.

$$\delta(q_0, a, a) = \{\quad\},\quad \delta(q_0, \lambda, a) = \{\quad\},$$
$$\delta(q_0, a, b) = \{\quad\},\quad \delta(q_0, \lambda, b) = \{\quad\},$$
$$\delta(q_0, a, z) = \{\quad\},\quad \delta(q_1, a, a) = \{\quad\},$$
$$\delta(q_0, b, a) = \{\quad\},\quad \delta(q_1, b, b) = \{\quad\},$$
$$\delta(q_0, b, b) = \{\quad\},\quad \delta(q_1, \lambda, z) = \{\quad\}.$$
$$\delta(q_0, b, z) = \{\quad\},$$

(2) Show that the npda accepts the string abba.

$$(q_0, abba, z) \vdash (\quad)$$
$$\vdash (\quad)$$
$$\vdash (\quad)$$
$$\vdash (\quad)$$
$$\vdash (\quad)$$
$$\vdash (\quad)$$