Automata Theory 2014.12.22

Homework 8

Due: 2014.12.25 midnight

Problem 1 Convert the following grammar to Chomsky Normal Form and then construct a nondeterministic pushdown automaton that accepts the same language.

$$S \to aAa|bBb|BB$$
$$A \to c$$
$$B \to S|A$$
$$C \to S|\epsilon$$

Problem 2 Convert the following pda which accepts by empty store to a one state pda.

$$\delta(q, a, Z) = \{(q, AZ)\}$$
$$\delta(q, b, Z) = \{(q, BZ)\}$$
$$\delta(q, a, A) = \{(q, AA), (p, \epsilon)\}$$
$$\delta(q, b, B) = \{(q, BB), (p, \epsilon)\}$$
$$\delta(q, a, B) = \{(q, AB)\}$$
$$\delta(q, b, A) = \{(q, BA)\}$$
$$\delta(p, a, A) = \{(p, \epsilon)\}$$
$$\delta(p, b, B) = \{(p, \epsilon)\}$$
$$\delta(p, \epsilon, Z) = \{(p, \epsilon)\}$$

Problem 3 Convert the one state pda you created in Problem 2 to a context-free grammar.