

Joshua Adams
Assignment 4
Programming Languages

1.

$\langle \text{exp} \rangle ::= \text{begin } \langle \text{multi-statement} \rangle \text{ end}$

$\langle \text{multi-statement} \rangle ::= \langle \text{empty} \rangle$
 $\quad \mid \langle \text{statement} \rangle ; \langle \text{multi-statement} \rangle$

2.

$\langle \text{exp} \rangle ::= \text{begin } (\langle \text{statement} \rangle ;)^+ \text{ end}$

3.

$\langle s \rangle ::= \text{aa} \langle \text{as} \rangle \langle \text{cs} \rangle \langle \text{bs} \rangle \text{b}$

$\langle \text{as} \rangle ::= \langle \text{empty} \rangle$
 $\quad \mid \text{a} \langle \text{as} \rangle$

$\langle \text{bs} \rangle ::= \langle \text{empty} \rangle$
 $\quad \mid \text{b} \langle \text{bs} \rangle$

$\langle \text{cs} \rangle ::= \langle \text{empty} \rangle$
 $\quad \mid \text{c}$
 $\quad \mid \text{cc}$

4.

$\langle s \rangle ::= \text{aa}(\text{a})^*(\text{c})^?(\text{c})^?(b)^+$