CMPT 383
Quiz #3
September 29, 2005

1) Using grammar 1, show the parse tree, the abstract syntax tree and the leftmost derivation for

```
A = B*(C*(A+B))
```

Grammar 1

<assign> ::= <id> = <expr>
<id> ::= A | B | C
<expr> ::= <expr> + <term> | <term>
<term> ::= <term> * <factor> | <factor>
<factor> ::= (<expr>) | <id>

2) Describe, in English, the language defined by grammar 2.

Grammar 2

<S> ::= <A> <B> <C>
<A> ::= a <A> | a
<B> ::= b <B> | b
<C> ::= c <C> | c

3) Which of the following sentences are in the language generated by grammar 3?

a) abcd
b) acccbd
c) acccbcc
d) acd
e) accc

Grammar 3

<S> ::= a <S> c <B> | <A> | b
<A> ::= c <A> | c
<B> ::= d | <A>

4) Convert the following EBNF to BNF:

a) <S> ::= <A> { b <A> }
b) <A> ::= a [b] <A>