

### CSCI 3236 Homework #3

Due date: September 14, 2022 (Wednesday), 11:59pm

#### Chapter 3 Exercises

1. (10pts) Let  $G$  be the grammar

$$S \rightarrow abSc \mid A$$

$$A \rightarrow cAd \mid cd$$

- a) Give a left-most derivation of  $ababccddcc$ .
- b) Build the derivation tree for the derivation in part (a).
- c) Use set notation to define  $L(G)$ .

2. (50pts) For each of the following context-free grammars, use set notation to define the language generated by the grammar.

a)  $S \rightarrow aaSB \mid \lambda$   
 $B \rightarrow bB \mid b$

b)  $S \rightarrow aSbb \mid A$   
 $A \rightarrow cA \mid c$

c)  $S \rightarrow abSdc \mid A$   
 $A \rightarrow cdAba \mid \lambda$

d)  $S \rightarrow aSb \mid A$   
 $A \rightarrow cAd \mid cBd$   
 $B \rightarrow aBb \mid ab$

e)  $S \rightarrow aSB \mid aB$   
 $B \rightarrow bb \mid b$