

## Theory Quiz

Name:

Answer each part for the following context-free grammar G:

$$\begin{aligned}R &\rightarrow XRX \mid S \\S &\rightarrow aTb \mid bTa \\T &\rightarrow XTX \mid X \mid \varepsilon \\X &\rightarrow a \mid b\end{aligned}$$

- a. What are the variables of G?
- b. What are the terminals of G?
- c. Which is the start variable of G?
- d. Give three strings in  $L(G)$ .
- e. Give three strings not in  $L(G)$ .
- f. True or False:  $T \Rightarrow aba$ .
- g. True or False:  $T \Rightarrow^* aba$ .
- h. True or False:  $T \Rightarrow T$ .

i. True or False:  $T \Rightarrow^* T$ .

j. True or False:  $XXX \Rightarrow^* aba$ .

k. True or False:  $X \Rightarrow^* aba$ .

l. True or False:  $T \Rightarrow^* XX$ .

m. True or False:  $T \Rightarrow^* XXX$ .

n. True or False:  $S \Rightarrow^* \varepsilon$ .

o. Give a description in English of  $L(G)$ .