

CSC 360 FINAL EXAM

Exam carries 30% of grade. All questions carry equal weight..

Time Limit: 180 min

Name:

1. What is the language of the following context-free grammar.
Give your answer in set-notation $\{\dots\}$

$$S \rightarrow aS \mid AB$$

$$A \rightarrow abA \mid b$$

$$B \rightarrow baB \mid a$$

2. Give the tree built by the **top-down breadth first** parse of **abbbaa** for the grammar:

$$S \rightarrow A \mid AB$$

$$A \rightarrow abA \mid b$$

$$B \rightarrow baB \mid a$$

3. Write a **regular expression** for the set of strings over $\{a, b\}$ which **do not begin** with the the substring 'aba'.
4. Give the state diagram of a DFA that accepts strings over $\{a, b\}$ which **contain** the substring 'aaba'.
5. Convert the following grammar rules into equivalent grammar rules without any **λ -rules**. Your answer must include NULL set.

$$S \rightarrow AB \mid BCS$$

$$A \rightarrow aA \mid C$$

$$B \rightarrow bbB \mid b$$

$$C \rightarrow cC \mid \lambda$$

6. For the following NFA construct an equivalent DFA.