CMSC 330 Fall 2016 Quiz #3 - SOLUTION

Gradescope ID ________________________________

Discussion Time (circle one)  
10am  11am  12noon  1pm  2pm  3pm

Discussion TA (circle one)  
Alex  Austin  Ayman  Brian  Damien  Daniel K.
Daniel P.  Greg  Tammy  Tim  Vitung  Will K.

Instructions

- Do not start this quiz until you are told to do so.
- You have 15 minutes for this quiz.
- This is a closed book quiz. No notes or other aids are allowed.
- For partial credit, show all of your work and clearly indicate your answers.

1. (4 pts) Write an NFA for \((a|b)^*(aa|bb)\).

   Sample Solution

   ![Diagram of NFA for (a|b)^*(aa|bb)]

2. (6 pts) Convert the following NFA to a DFA. Provide proof of your work.

   Solution:

   ![Diagram of DFA derived from NFA]

3. (4 pts) For the following NFA:

   Circle “accept” if the following string is accepted
a. baab accept
b. abb Not accept
c. ababab accept
d. bbbbaaab accept

4. (6 pts) Given the grammar:
   S -> SaS | T | a
   T -> Tb | bSb | ε

   Provide a leftmost derivation of the string “bababb”

   S -> TαT -> bSbaT -> babaT -> babaTb -> babaTbb -> bababb