CMSC330 Spring 2011 Quiz #1 - SOLUTIONS

Name ________________________________

Discussion Time (circle one): 9am  10am  11am  12pm  1pm  2pm

Instructions
• Do not start this test until you are told to do so!
• You have 15 minutes for this quiz.
• This is a closed book exam. No notes or other aids are allowed.
• For partial credit, show all of your work and clearly indicate your answers.
• Write neatly. Credit cannot be given for illegible answers.

Questions 1-3 refer to regular expression \( r = a^*ba^*ba^* \).

1. (1 pt) Given an example of a string in the language of \( r \).
   \( bb, abb, abab, abba \) (any string with exactly 2 b’s)

2. (1 pt) Give an example of a string in \( \{a,b\}^* \) that is not in the language of \( r \).
   \( \epsilon, a, abbb, aaba \) (any string containing fewer, or more than, 2 b’s)

3. (4 pts) Give an NFA accepting the language of \( r \). (You can use the method given in class if you want to, but this is not required.)

   ![NFA Diagram]

4. (4 points) Give regular expressions for the following languages over the alphabet \( \{a,b\} \).
   a. (2 points) Strings ending with an a.
      \( (a | b)^*a \)

   b. (2 points) Strings containing no occurrence of aa.
      \( (b | ab)^*(\epsilon | a) \)