

# CMSC330 Spring 2023 Quiz 3 Solutions

Proctoring TA: \_\_\_\_\_ Name: \_\_\_\_\_

UID: \_\_\_\_\_

## Problem 1: Basics

[Total 3 pts]

Please circle **True** or **False** for the following statements:

DFA's can contain epsilon transitions    **True**    **False**

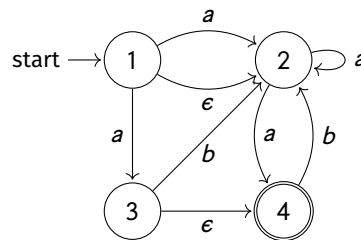
All DFA's are NFA's    **True**    **False**

All NFA's can be converted to Regex    **True**    **False**

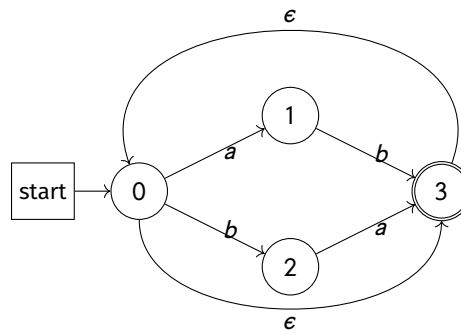
## Problem 2: NFA to DFA

[Total 8 pts]

Convert the following NFA to a DFA. Square/circle your final DFA.



[Total 9 pts]

**Problem 3: NFA and Regex**

[2 pts]

(a) What Regex corresponds exactly to the following NFA? (Only circle the regex that best matches the NFA)

☐  $(abba)^*$     
 ☐  $(ab)^+$     
 ☐  $(ba)(ba)^*$     
 ☐  $abba$     
 ☐  $(ab|ba)^*$

[2 pts]

(b) Which of the following strings are accepted by the NFA? (You may choose more than one answer)

☐ Empty String    
 ☐ a    
 ☐ abba    
 ☐ baabb    
 ☐ bba

[5 pts]

(c) Convert the following Regex to NFA:  $(a|b)^*c$