Capital University of Science and Technology

Department of Computer Science

CS3613 – Theory of Automata and Formal Languages

ASSIGNMENT NO. 2

Semester: Fall 2022 **Max Marks:** 100

Instructor: Muhammad Owais

Assigned Date: November 3rd, 2022 **Due Date:** 13th November 2022

Name: **Reg. No.**

Question No. 1 [30 Marks]

a. Convert following **RE** into **NFA**?

1. **ab*(ab)*(a+b)b**
2. **(a+b)*(aa+bbb)**

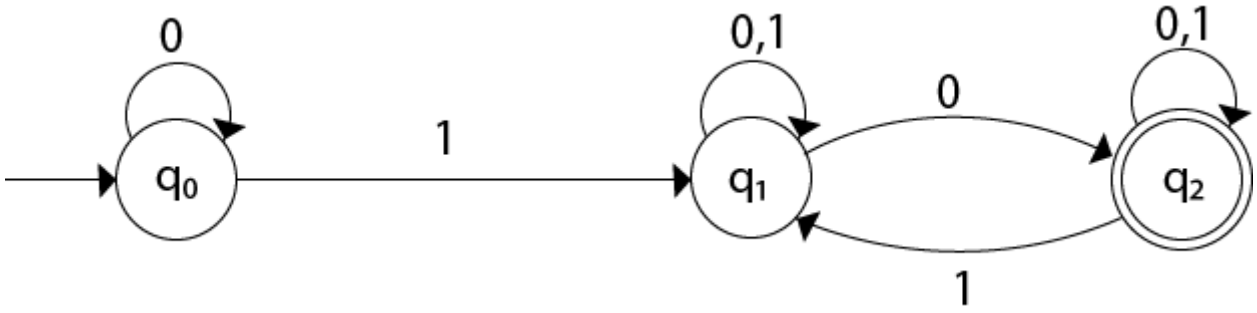
b. Convert all **NFA** that are generated in **part a** into **DFA**?

c. Convert all **NFA** that are generated in **part a** into **GTG**?

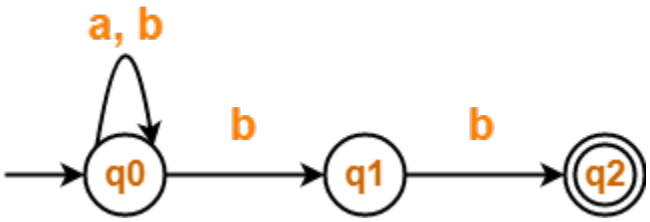
Question No. 2 [30 Marks]

Convert the given Non-Deterministic Finite Automata to Deterministic Finite Automata.

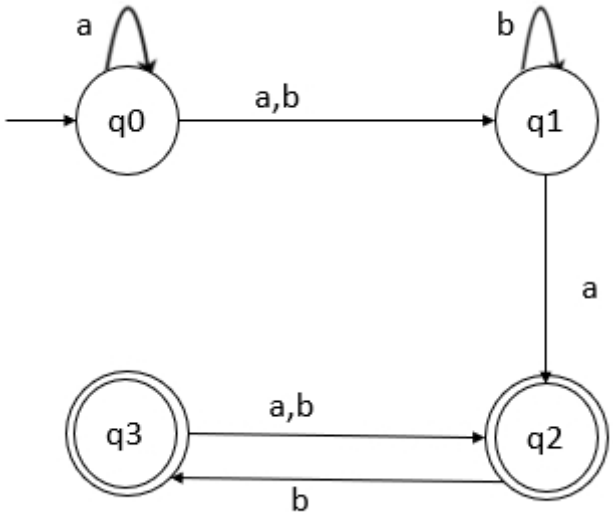
a)



b)



c)



Question No. 3 [40 Marks]

a. Draw the Transition graph (TG) for language of words in which the "b" occur only in even clumps and that end in four or more a's.

b. Draw the Transition graph (TG) for language of words starting with three a's or three b's and ending with bb or aa

c. Draw the Transition graph (TG) for language of words having aab or bba anywhere in it.

d. Draw the Generalized Transition graph (GTG) for below given regular expression:

e. a*+ (ab+a) * (b+ ?)+a*.