Name: \_\_\_Demetrius Johnson\_\_2/23/2021\_\_\_\_\_\_\_\_\_\_\_\_

*No calculators are allowed.* Show your work. The points for each problem are indicated. Problems with incomplete work may receive partial, or no credit.

***COs: [No direct COs]***

**Points: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ / 20**

1. [5 pts] Let the alphabet Σ = {a, b, c}. Given the regular expression r = b(a + c)\*b, assume a language L(r) is the language defined by the regular expression r. Explain in English what accepted strings in the language are like.
2. [10 pts] Give the configuration after applying the ***appropriate*** transition function from those listed, using the symbols a, b, c. Only apply the transition function **once**. PICK THE CORRECT TRANSITION FUNCTION, and apply it, giving your final configuration

Assume your **original configuration** is: **abbq1aabac**

**Transition functions available:**

* **δ(q1, a) = (q2, a, L)**
* **δ(q1, b) = (q3, c, R)**
* **δ(q1, c­) = (q1, c, L)**
* **δ(q2, a) = (q3, c, R)**

1. [5 pts] One of the biggest open (that is, unsolved) theoretical computer science questions, is “Is P = NP”. We do know that P NP. In your own words, what does *that* mean?