



Student Name:

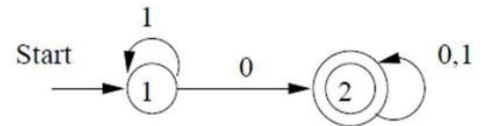
Academic ID:

Group:

1. Choose all the correct answer.

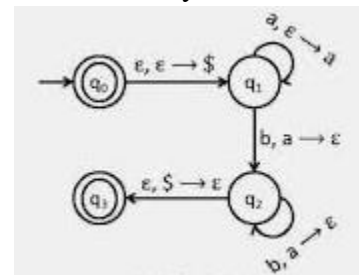
i. The shown state diagram is rejecting string

- A. "1000"
- B. "0001"
- C. "0000"
- D. "1111"

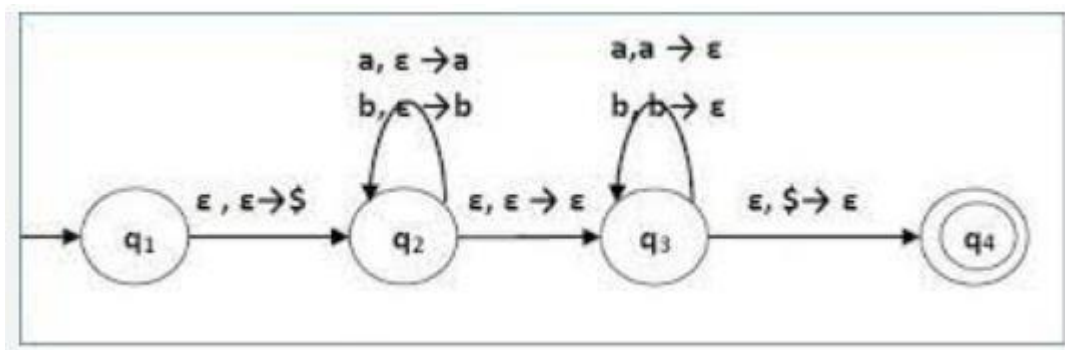


ii. Which of the following languages describes the shown PDA correctly?

- A.  $L = \{a^{2n}b^n : n \geq 1\}$ .
- B.  $L = \{a^n b^{2n} : n \geq 1\}$ .
- C.  $L = \{a^n b^n : n \geq 1\}$ .
- D.  $L = \{a^{2n} b^{2n} : n \geq 1\}$ .



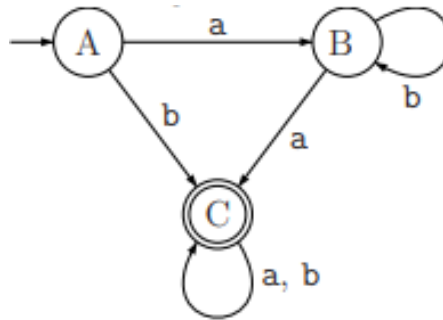
2. Given the PDA shown in the figure



- a. Find the function of the shown PDA.
- b. Does the shown PDA accept string "abaab"? (with steps)
- c. Does the shown PDA reject string "abba"? (with steps)

3. Find CFG for Give a context-free grammar that generates the following language over  $\{0, 1\}^*$ :  $L = \{w | w \text{ contains more 1s than 0s}\}$

4. Design a TM as an Adder.
5. Convert FA shown in Fig. 1 into RE and RG.



**Figure 1**

- 6.