

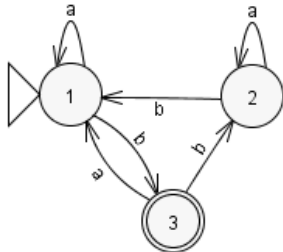
Student ID :
Name-Surname :

Theory of Computation midterm exam (2019-2020 Fall)

(Please use free space for draft and fit your answer to boxes.)

1. (25P) A family members (2 parents and 2 children) wants to walk side by side on the road. Each parent holds one children's hand. Both children can be in the middle or on the sides at the same time. Design a NFA that accepts all possible walking situations.

2. (25P) Convert the DFA given below to Regular Expression.



3. (25P) Write down the CFG rules of the grammar given below.

$$L(G) = \{ab^n a^n a : n \geq 0\}$$

4. (25P) Design a PDA that accepts the words generated by the grammar given below.

$S \rightarrow AB|\epsilon$
 $A \rightarrow AA|a$
 $B \rightarrow b$