DatZ1037: Automata Theory

Autumn 2019 — Instructor: Abuzer Yakaryılmaz

EXAM 1 (duration: 60 minutes)

Name and surname:

Date: Tuesday, October 15, 2019

Questions

(There are 4 questions with total 10 points.)

Give the state diagrams of deterministic finite automata (DFAs) recognizing the following languages.

1) $L_1 = \{a^i \mid i \equiv 0 \mod 3\}$, where the alphabet is $\Sigma = \{a\}$. (2 points)

2) $L_2 = \{a^i \mid i \equiv 1 \mod 5 \text{ or } i \equiv 2 \mod 5\}$, where the alphabet is $\Sigma = \{a\}$. (3 points)

3) $L_3 = \{aa, aaaaa\}$, where the alphabet is $\Sigma = \{a\}$. (2 points)

4) $L_4 = \{w \mid w \text{ contains at least three } a\text{s and exactly one } b\}$, where the alphabet is $\Sigma = \{a, b\}$. (3 points)