

Ege University
Department of Computer Engineering
Automata Theory
2020-2021 Fall
HOMEWORK-3

Date Given: 14.01.2021

Due Date: 21.01.2021

QUESTIONS

Q1.)

$S \rightarrow aS \mid aSb \mid X$

$X \rightarrow aXa \mid a$

Answer the following questions considering the CFG given above.

- i)** Draw the derivation tree for the string aaaa.
- ii)** Draw the total language tree.
- iii)** Convert this CFG into Chomsky Normal Form (CNF).

Q2.)

$L = \{a^n b^m a^n \mid n, m = 1, 2, 3, \dots\}$ is given.

- i)** Write a CFG for the language L.
- ii)** Construct a push down automata (PDA) model that accepts L. (*PLEASE USE THE NOTATION GIVEN IN THE TEXTBOOK WHILE DRAWING THE PDA, PDA's CONSTRUCTED USING OTHER NOTATIONS WILL NOT BE EVALUATED.*)
- iii)** Show the leftmost derivation for the string aaaabbbbaaaa.
- iv)** Draw the derivation tree for the string aaaabbbbaaaa.

Evaluation : Q1.) i)10p ii)20p iii)20p Q2.) i)10p ii)20p iii)10p iv)10p