

ArsDigitaUniversity
Month8:TheoryofComputation
ProfessorShaiSimonson

Exam2(50points)

1._____ (10points)

2._____ (18points)

3._____ (7points)

4._____ (15points)

Total_____ (50p oints)

2. Name that Set (18 points)

Decide which of the sets below is Deterministic Context Free, Context Free or not Context Free. Prove your answers. (Hint: There is one of each.)

a. The complement of $\{0^i 1^j\}$ where $0 < i < j$.

b. $\{0^i 1^j 0^i 1^j\}$, $i, j > 0$.

c. The set of all strings $0^i 1^j 2^k$ where either $i = j + k$ or $k = i + j$.

3. Chomsky Normal Form (7 points)

Convert the grammar below into Chomsky Normal Form. Explain all your steps.

$S \rightarrow SAB|e$
 $A \rightarrow 0S1|CD|e$
 $B \rightarrow 1S0|e$
 $C \rightarrow BC|AC|0$
 $D \rightarrow CD$

