

CSE105, Fall 99 Review Sheet for Final Exam

Finite Automata:

Construction, acceptance, language of, state diagram

Regular operations and their closure

NFA vs DFA: **Will not be asked to carry out subset construction**

Differences, Size NFA vs DFA, Equivalence

Regular Expressions:

Definition, construction, use in lexical analysis, Reg Exp to NFA **No DFA to reg exp**

DFA state minimization

Non-regular languages:

Examples, pumping lemma (**Will not be asked to carry out application**)

Decide if a string is described by a regular expression

Construct a regular expression from a simple description

Construct an NFA or DFA for a regular expression or a simple description

CFG:

Definition, construction, derivation (rightmost, leftmost), language, equivalence

Parse tree construction, Ambiguity, determine ambiguity, left and right associative

(**No left factor or imm. left recursion**)

Regular language to CFG construction

Chomsky Normal Form: construction, derivation length

Non-CFL: Ex, statement pump lemma (**Will not be asked to carry out application**)

PDA: Def, acceptance, example, equivalence with CFG's (**Not asked to show**)

deterministic vs. nondeterministic, power

TM:

Definition, construction, acceptance, configuration, variants and equivalence

Decidable Turing-recognizable, Statement of Church-Turing thesis

Relationship between and examples of languages: regular, CF, decidable,

P, NP, Turing-recognizable and not, and all languages

Decidability and Undecidability:

Problems, examples, universal Turing machine, A_{TM} , Halting problem

1-1 correspondence, countable, Diagonalization

Examples of decidable, undecidable, T-rec. un-T-rec. problems

Mapping reducibility: def., uses for decidability and Turing-rec.

Complexity:

Difference from decidability, running time, time complexity

P, NP: Examples, $P = NP?$, NP-completeness (def, example)