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**)
determinstic vs. nondeterminstic, power

TM:

Definition, construction, acceptance, configuration, variants and equivalence
Deciadable 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)