Choose 2 out of the following 3 subjects for 15 point each.

1) Based on your implementation of the DPLL algorithm answer the following two questions (without necessarily giving precise code).

a) 7 points: What changes in your algorithm would be needed to print the FIRST of the set of truth-value assignments to variables that allowed your program to answer YES for a satisfiability problem.

b) 8 points: What changes in your algorithm would be needed to force your program to print out ALL the truth-value assignments that lead to a YES answer for a satisfiability problem.

2) In a language of your choice, write a basic Turing Machine emulator. You can assume input is on a one directional infinite tape and the symbols used are 0,1 and BLANK=2.

3) In a language of your choice, write a CF grammar in Chomsky normal form that recognizes non-empty sequences of balanced parentheses.