1. Logic
   • Be able to interpret predicate calculus formulas in English.
   • Be able to answer questions about the normalization done by resolution theorem
     provers for predicate calculus in order to get the formulas into conjunctive normal
     form.
   • Be able to give the clause form equivalent (CNF) of a SIMPLE set of formulas.
   • Be able to show how to produce a resolvent on a SMALL set of SIMPLE formulas.
   • Be able to perform a given small resolution proof.

2. Game Playing
   • Be able to develop a utility function for a given game or show how a given one
     works.
   • Be able to show how a basic minimax search works for some given example.
   • Be able to show how the alpha-beta procedure works for some given example.
   • Be able to show how shallow search might be used to improve the alpha-beta
     procedure.
   • Be able to answer questions about how Samuel’s checker player works.
   • Be able to show how minimax generalizes to games of chance.

3. Learning
   • Be able to use a given decision tree to classify a test vector.
   • Be able to construct the best decision tree for a given training set by
     (a) yourself, given the criteria for best
     (b) information gain
     (c) information content
   • Be able to answer questions about overfitting in decision trees and what can be
     done about it.
   • Be able to answer questions about the ensembles: bagging, boosting, stacking,
     and Chou’s system for classifying pap smears.
   • Be able to show how a given perceptron classifies a test vector.
   • Be able to answer questions about how perceptrons learn their weights.
   • Be able to answer questions about the EM algorithm and how it differs from
     K-means.