Final exam study guide

The final is comprehensive, covering chapters 3-10, 12-15 of the text, plus blind and heuristic search as covered in class and the readings, and all the topics in all parts of the course. For review, see your midterm, the practice questions handed out in preparation for the midterm, and all the written assignments. Also, be sure to do all the alpha-beta practice exercises.

The student who is knowledgeable of the following topics will do well on the exam:

the basic different kinds of search - what they are and what they are good for:
- breadth-first search
- depth-first search
- iterative-deepening search
- A* algorithm
- admissible heuristics
- minimax search
- alpha-beta pruning (do the exercises handed out, left-to-right then right-to-left)
- idea of Monte Carlo tree search

Markov decision processes
- optimal policies
- returns, discounting
- value functions (four of them - definition, uniqueness)
- Bellman equations as systems of linear equations

Dynamic programming
- value iteration
- policy iteration
- Generalized policy iteration

TD learning algorithms
- TD(0)
- Sarsa
- Q-learning
- Eligibility traces

Linear function approximation for prediction and Control
Tile coding
Monte Carlo learning
backup diagrams
- for TD, DP, MC algorithms, multi-step backups, and for each value function
- how to draw the diagram for each kind of method
- how to write the backup equation for each diagram

TD vs MC, batch updating, and the MSE
The role of lambda in TD(lambda)
incremental computation of averages
Dyna
The difference between planning and learning
The strengths and weaknesses of sample-based planning

Eligibility traces
Average reward