

## Part 2 Written Responses

### Question 4

1. If the ghosts were to play optimally, they would always converge on Pacman, hence alpha-beta will always commit suicide in an attempt to maximize its minimum guaranteed. Expectimax, meanwhile, considers that the ghosts may not converge on him and thus pursues the great reward of not dying and eventually collecting the food pellets.
2.
  - a. True. The minimax value of the root (max) node is the smallest score guaranteed to the maximizing player, assuming that the opponent plays optimally. Expectimax also considers the possibility of non-optimal moves, and hence the possibility of achieving a score that is greater than this minimum.
  - b. True. Minimax considers the scenario where the opponent chooses the worst outcome for the player, so any other choice that the opponent could make is guaranteed to have at least that score, otherwise it would be the minimax value.
  - c. False. The Expectimax value is the average of the value moves that the opponent could make; by definition then, there is some choice that has a value less than this average, assuming that all values are not equal. In other words, the opponent could make a choice that results in less than the expected value, and hence the minimax value could be smaller.