CS 771 Artificial Intelligence
## Spring 2019   Homework 3 (70 points)

Assigned: Wednesday, February 20, 2019
Due: Wednesday, February 27, 2019

1. (20 points) Consider Figure shown below. the triangle indicates MAX node and the inverted triangle indicates MIN node.

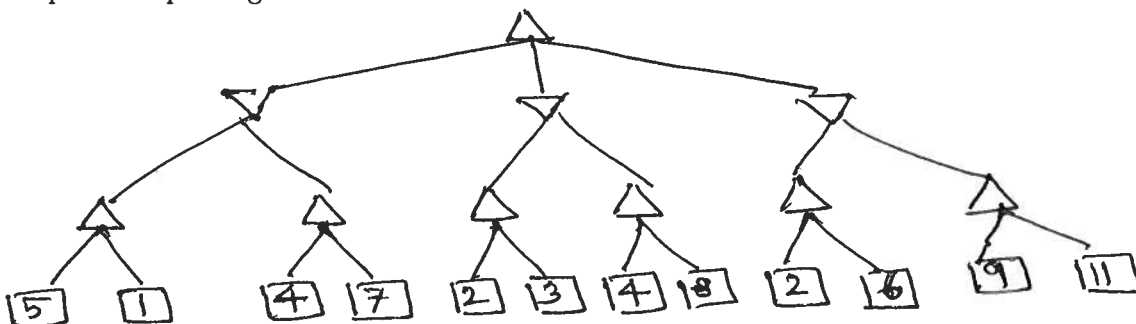   (a) If you use Minimax algorithm, what will be the value at root?

   (b) Now consider using alpha-beta pruning algorithm. Mark the branches that can be pruned using alpha beta pruning. .
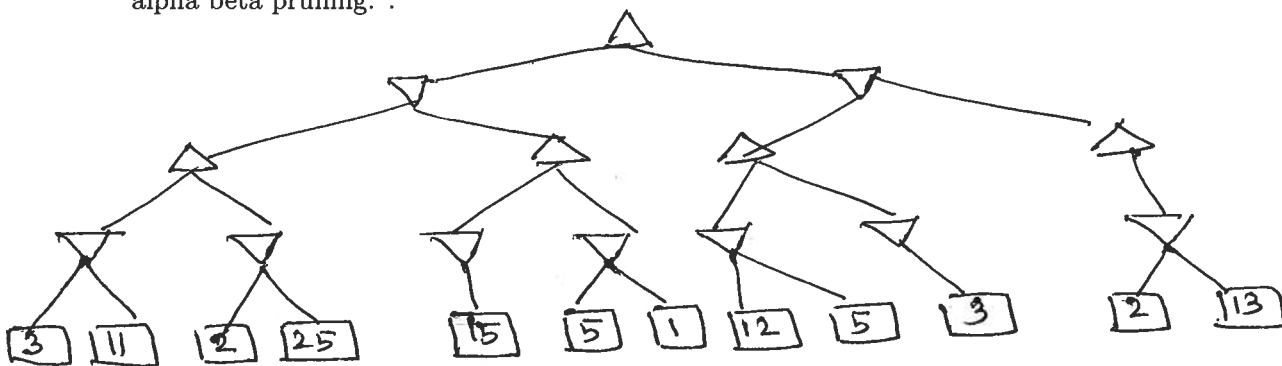
2. (20 points) Consider Figure shown below. The triangle indicates MAX node and the inverted triangle indicates MIN node.

   (a) If you use Minimax algorithm, what will be the value at root?

   (b) Now consider using alpha-beta pruning algorithm. Mark the branches that can be pruned using alpha beta pruning.

3. (30 points) Consider Figure shown below. the triangle indicates MAX node and the inverted triangle indicates MIN node.
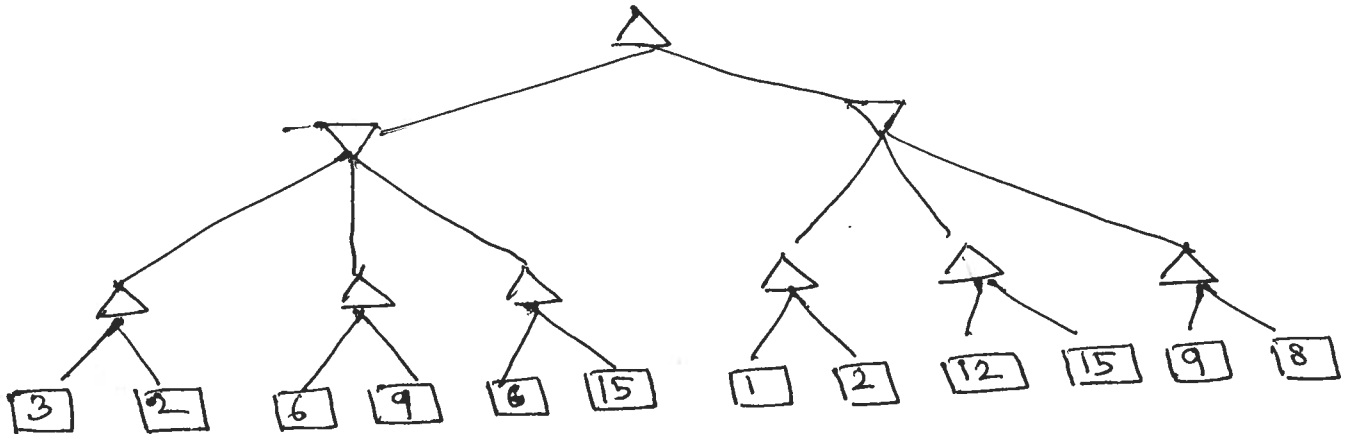
   (a) If you use Minimax algorithm, what will be the value at root?

   (b) Now consider using alpha-beta pruning algorithm. Mark the branches that can be pruned using alpha beta pruning.

4. (T/F) Questions.

   (a) (2 points) In solving a CSP problem, k-consistency for $k = 2$ corresponds to node consistency.

   (b) (2 points) Chess is an example of zero-sum game.

   (c) (2 points) Any consistent assignment of variables is a solution for a CSP problem.

   (d) (2 points) Consider the case in an adversarial search, where MAX makes the first move using minimax algorithm. In this game, MAX can be easily beaten if MIN plays sub-optimally.

   (e) (2 points) In adversarial search, solution obtained by alpha-beta pruning algorithm can be different from a solution obtained by minimax algorithm.