**AI TUTORIALS: August 30 2021**

Instructions: Solve the problems given below using pen and paper. Write your name and roll number clearly on every page. Take a scan or picture and post in the Google Form provided

1. Consider the problem of allocating a piece of Land of area A having three different categories, 1, 2 and 3 (each having total area A1, A2 and A3, respectively such that A1+A2+A3 = A) to n bidders. Each bidder gives a list of ordered options identifying the <category, amount of land requested, assured return from that amount of land, employees employed for utilizing this piece of land>. The objective is to allocate the land so as to maximize total return while ensuring that each bidder does not get more than one allocation per category and no more than a total of two allocations. If there are two solutions of the same total return, we select the one with highest number of total employed persons.

   Give a state space definition of problem with definition of state, state transformation rules, start and goal states and heuristic estimate. Give examples to explain your definition clearly and show a portion of the state space with an example.

2. Consider the Game Tree given below
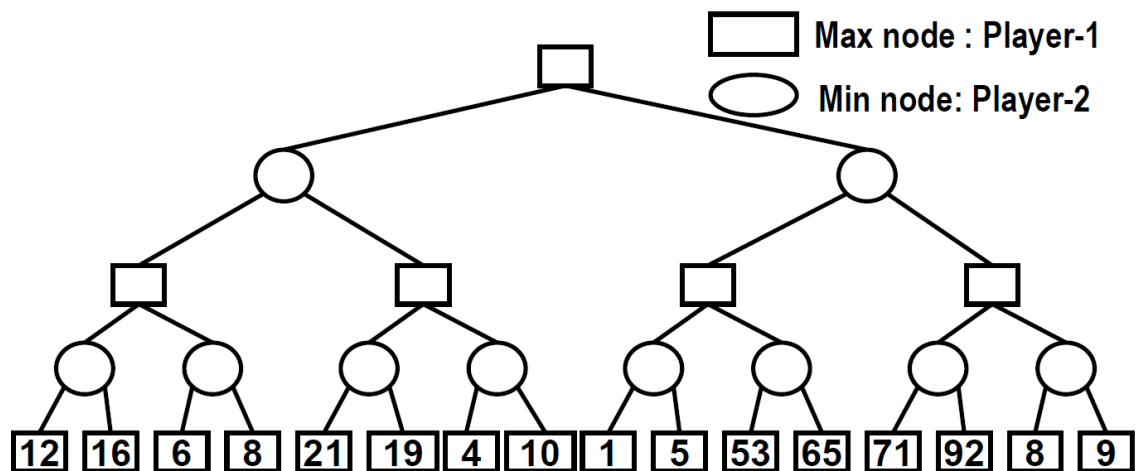
   Present the working of the alpha-beta pruning algorithm under these situations:

   (a) When we see successors from left to right

   (b) When we see successors from right to left.

   (c) Modify at most two leaf node values that will increase pruning for both left to right and right to left searches.