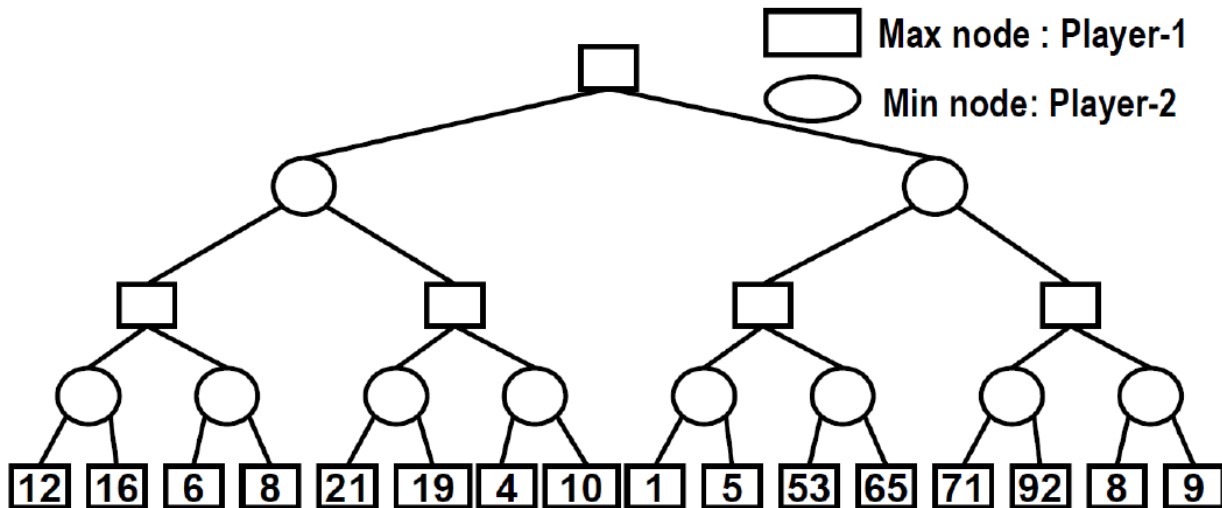1. Consider the Game Tree given below



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.

2. Given the above game tree what is the best leaf node  ordering (leading to maximum pruning) or worst leaf node ordering (leading to minimum pruning) for alpha-beta? You have to keep node pairs in the leaf level together (e.g., [12,16], [6,8]), though you may change their order in the pair (e.g., [12,16] can be rearranged as [16,12]).

3. Comment on the following statements with justification:
(a)     Alpha-beta pruning can alter the computed minmax value of the root of a game tree.
(b)     When doing alpha-beta pruning from left to right, the leftmost branch will never be pruned.

4. In a town in Utopia, people from different religions live harmoniously. It has been a feature that neighbour families do not belong to same religion. Another interesting feature of this town is that it hosts families from every possible religion. Below are presented some facts about the town. Translate them into First-Order-Logic (FOL).
(a)  Neighbouring families do not have the same religion.
(b)  The town contains only 2 Jewish families.
(c)  Starting from a Buddhist family one can reach a Bahai family within 4 steps.
(d)  For each religion, there is at least one family with that religion in the town.

5.  Represent following statements in First-Order-Logic
(a) Some students of AIFA course have got placed in Google and rest has been placed in Facebook
(b) Something that glitters is not always gold, whereas the gold always glitters.
(c) Only one student took Hieroglyphics in Autumn 2022.
(d) No student participated in Marathon but at least one student participated in Hackathon.