Min-Max Algorithm

Name :- Mrunali shridhar Virkud

Class :- BE IT

Roll No. :- 75

subject :- AI / ISLAB

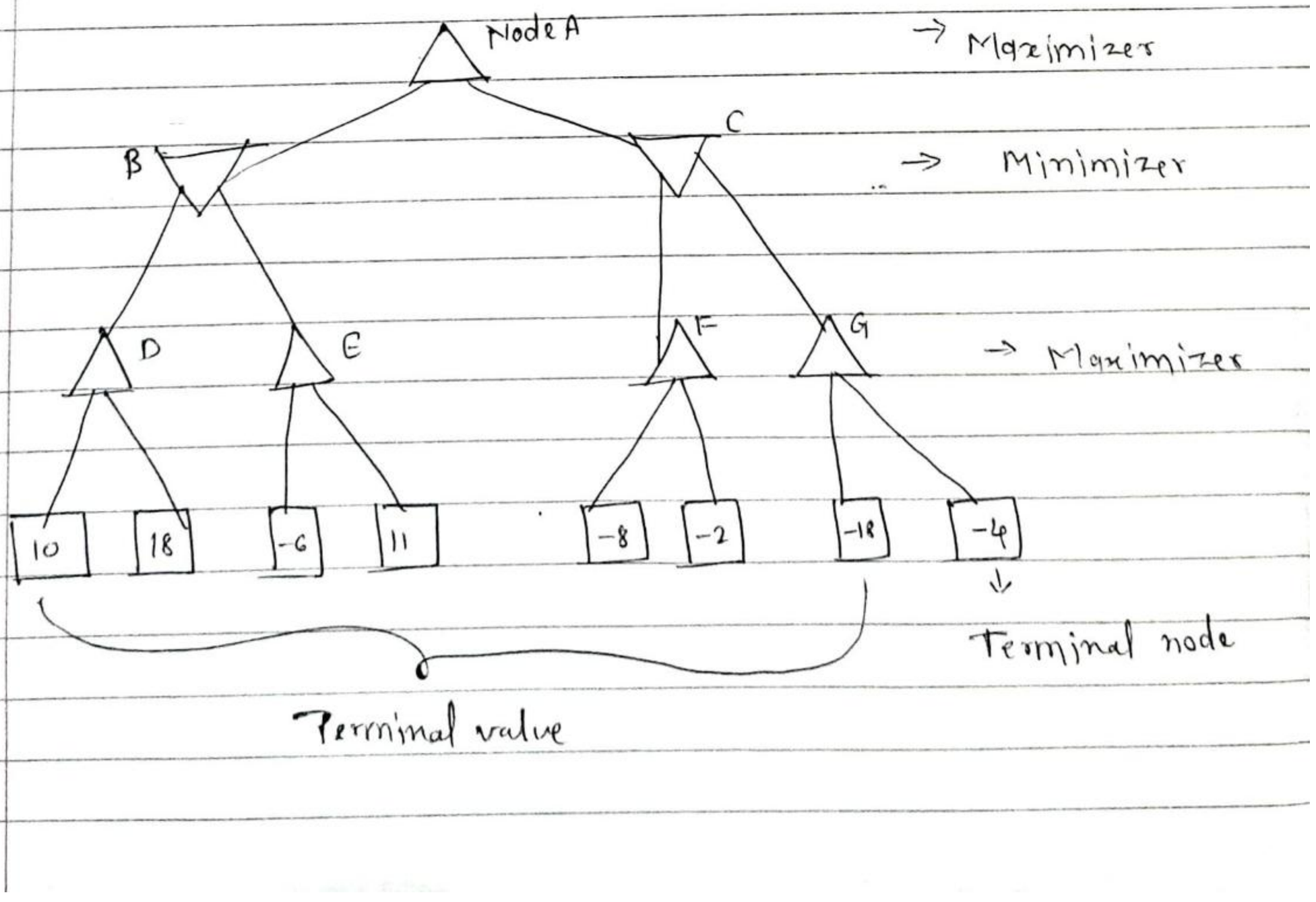
sem :- VII

Min-Max Algorithm

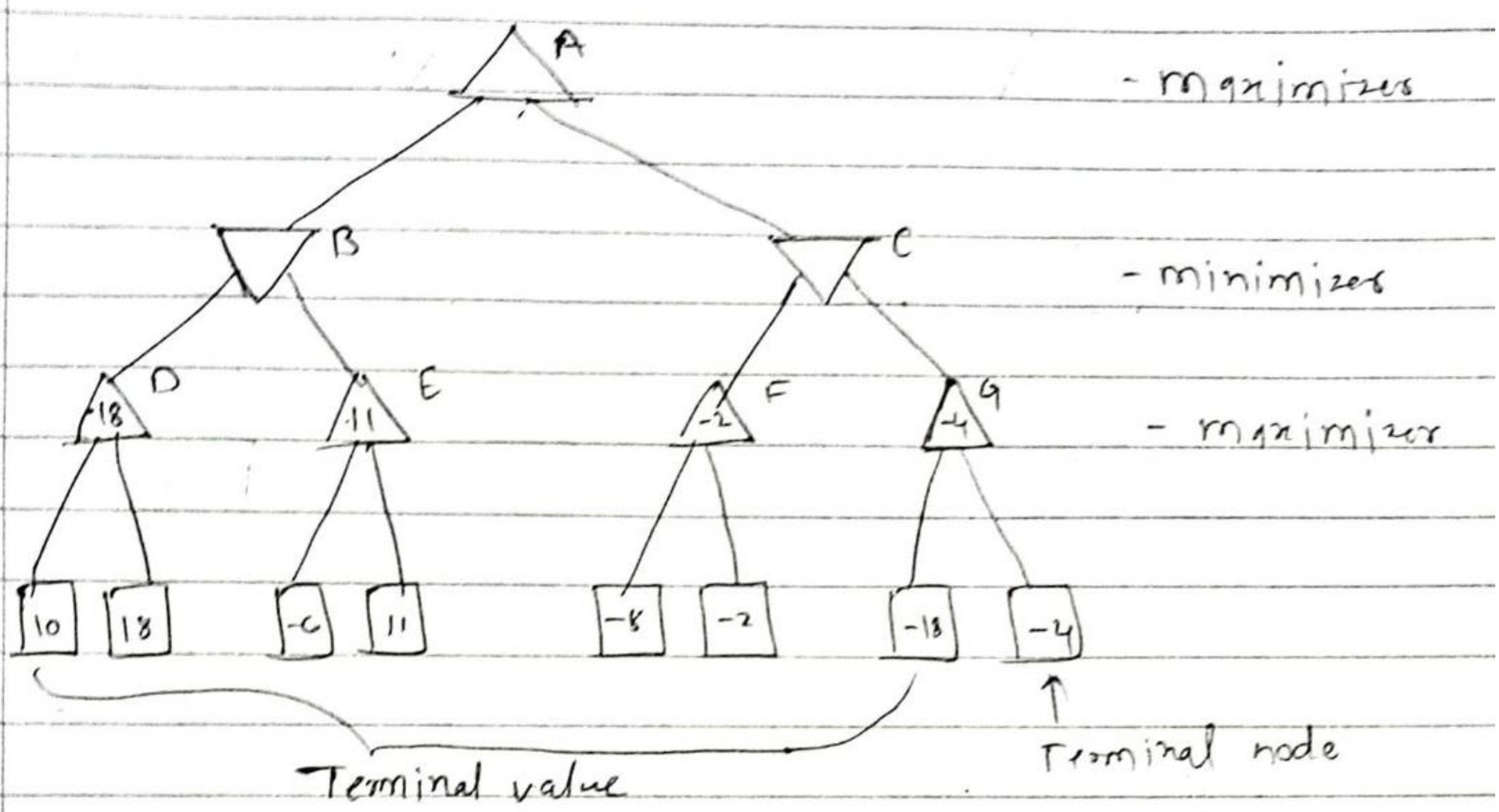
Min-Max Algorithm :
Min-max algorithm is a recursive of back tracking algo which is used in decision-making & game theory. It provides an optimal move for the player assuming that Opponent is also playing optimally.

- Min-max algo uses recursion to search through the game tree
- In this algo two players play the game, one is called MAX & other is called MIN.
- Min-max algo is mostly used for game playing in AI.

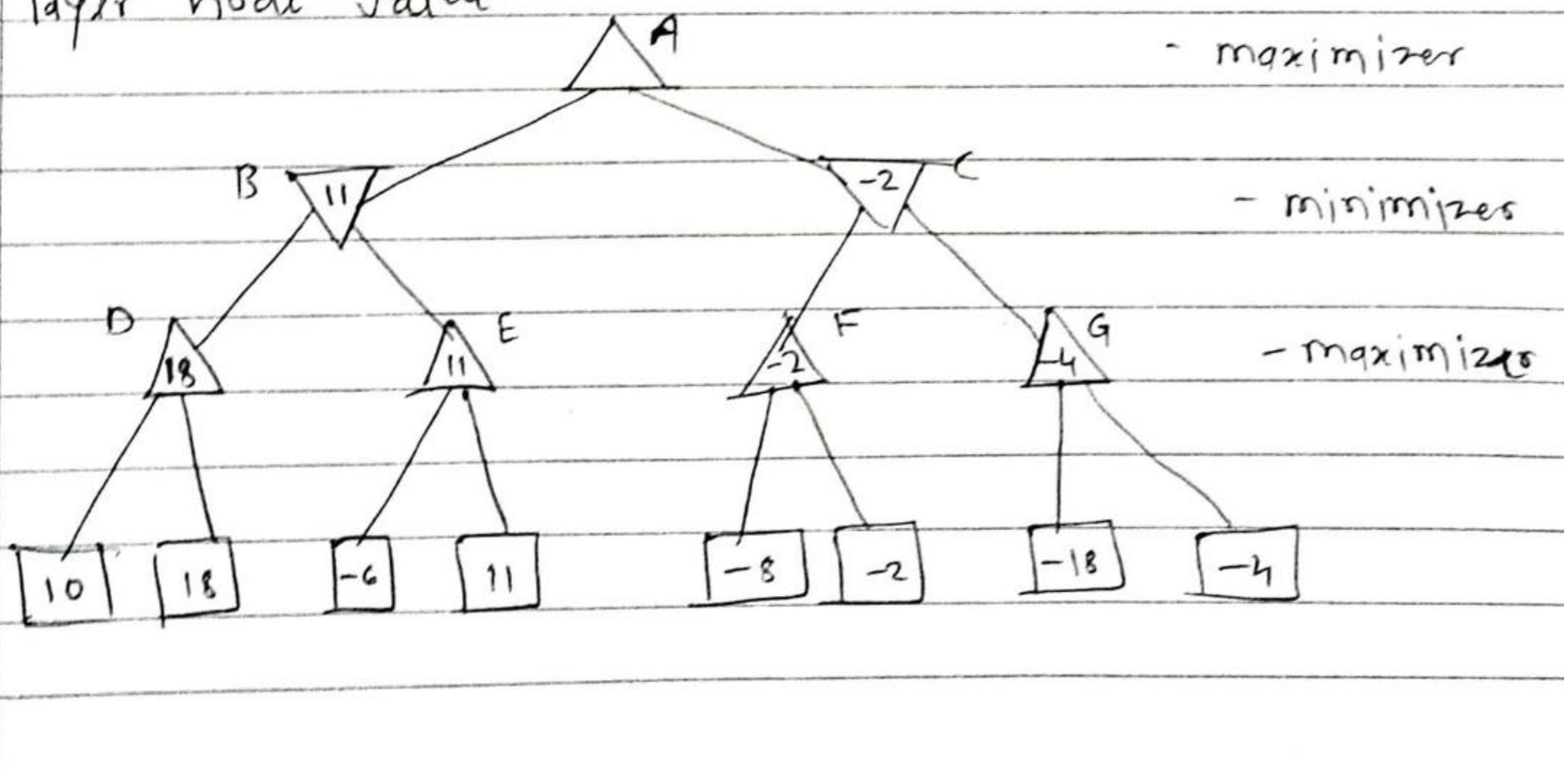
step 1 :
Lets take A is the initial state of the tree. Suppose maximizer takes first two (whenever) which has worst-case initial value = $-\infty$, & minimizer will take next turn which has worst-case initial value = $+\infty$



step 2:
First we find the utilities value for the maximizer, its initial value is $-\infty$, so we will compare each value in terminal state with initial value of maximizer & determines the higher nodes value. It will find the maximum among all.
For Node D : $\max(10, -\infty) \Rightarrow \max(10, 18) = 18$
For Node E : $\max(-6, -\infty) \Rightarrow \max(-6, 11) = 11$
For Node F : $\max(-8, -\infty) \Rightarrow \max(-8, -2) = -2$
For node G : $\max(-17, -\infty) \Rightarrow \max(-17, -15) = -15$

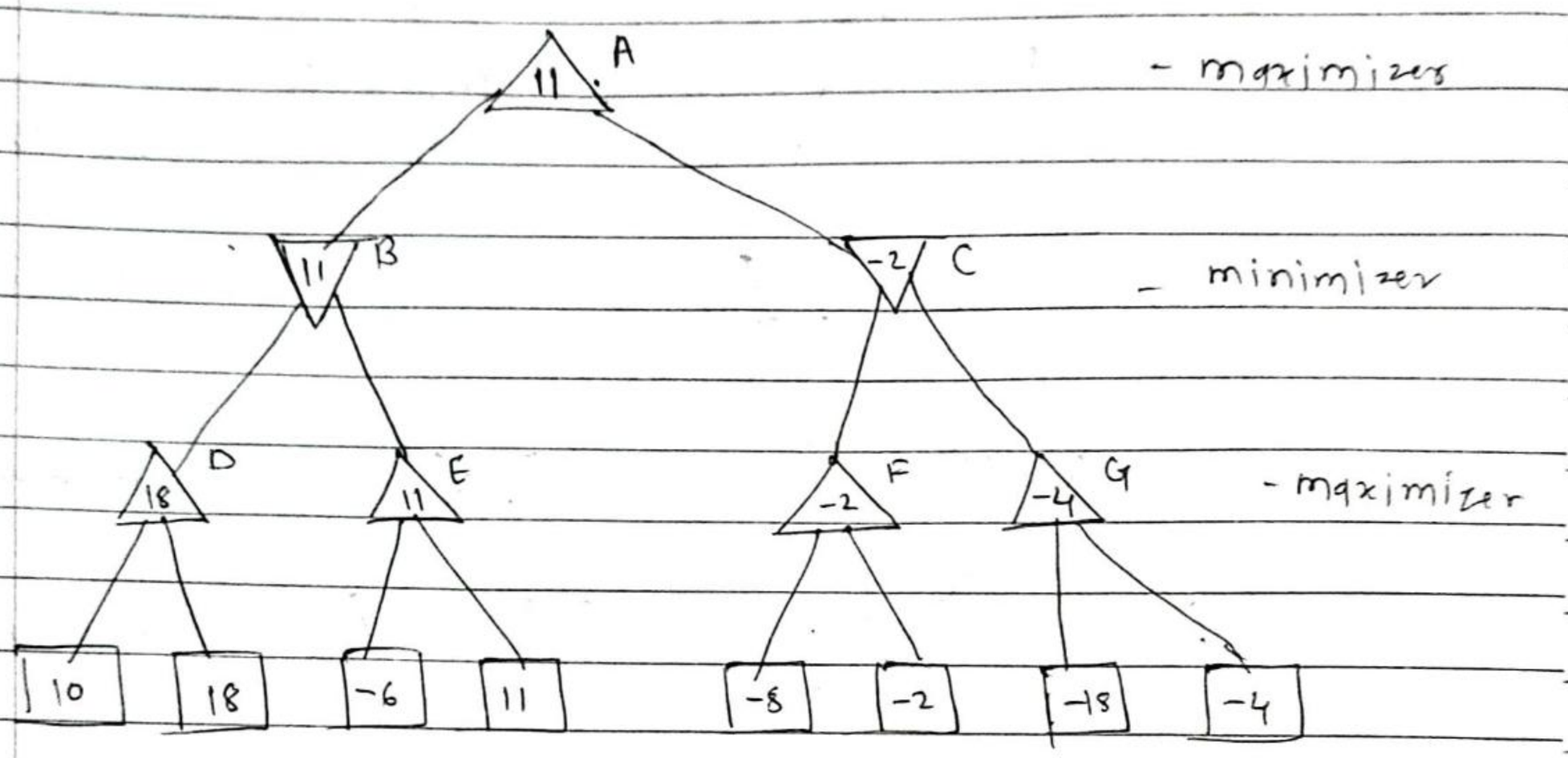


Step 3:
In the next step, its a turn for minimize, so it will compare all nodes value with ~~two~~, & will find third layer node value



Step 4:
Now its a turn for maximizer, & it will again choose the maximum of all nodes value & find the maximum value for the root node.

For node A : max(11, -2) = 11



Hence, it was the complete workflow of the minmax Algorithm with two player game.