Q.2

Initial population = [[1,2,3,1,2,3,1], [2,1,3,2,3,1,1],
[3,3,1,2,2,1,3], [1,3,2,1,2,3,3],
[3,1,2,3,2,1], [2,3,1,1,3,2,2]]

fitness value = [410, 435, 400, 420, 430, 445]

Parent1 = [1,2,3,1,2,3,1], Parent2 = [2,1,3,2,3,1,1]

Crossover at point = 4:-

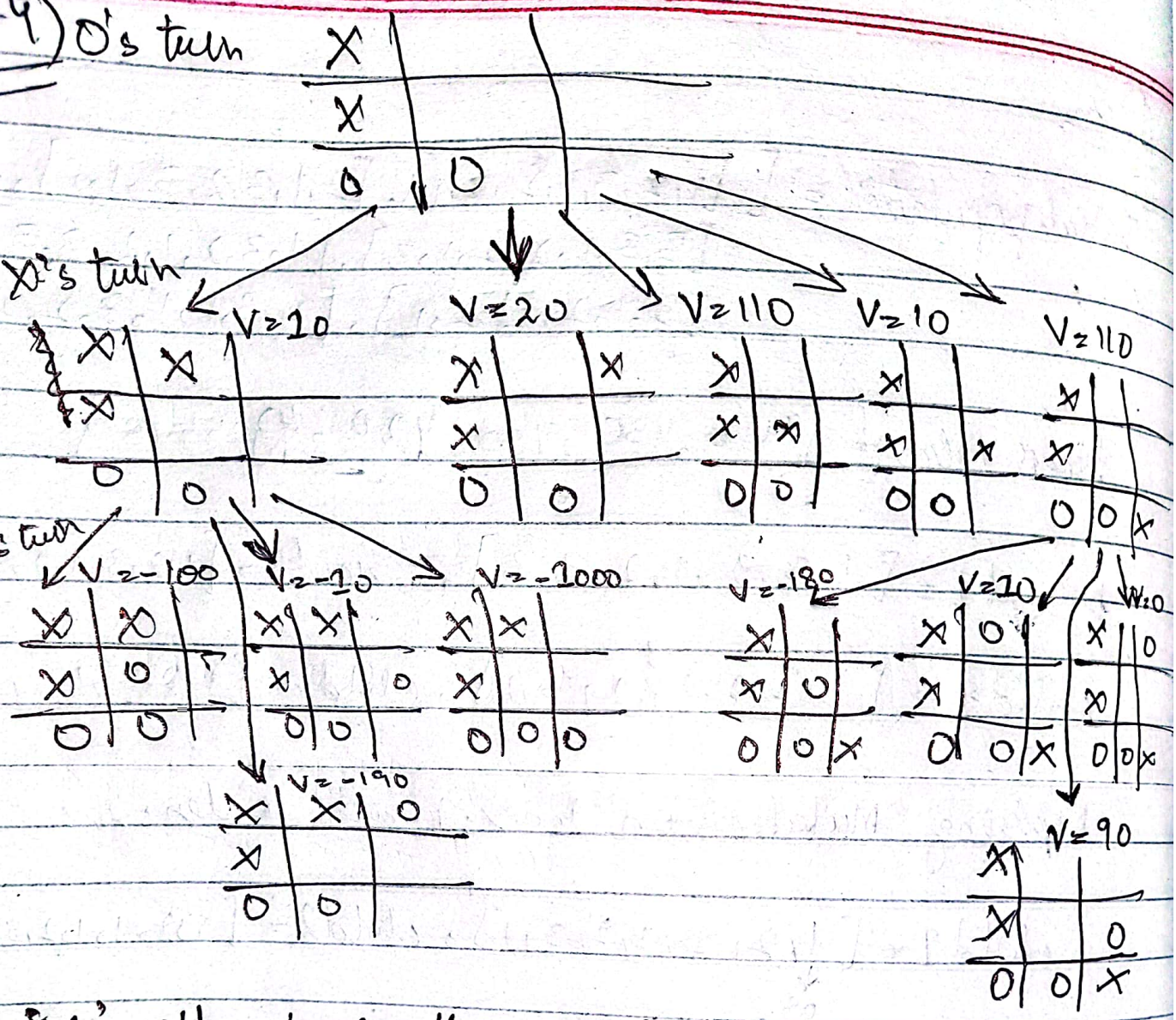
child 1 = [1,2,3,1,3,1,1], child 2 = [2,1,3,2,2,3,1]

mutation at idx1 = 0, idx2 = 0

child 1 = [2,2,3,1,3,1,1], child 2 = [1,1,3,2,2,3,1]

Add both childs in new population and do all steps again, until the generation becomes 50/xyz.

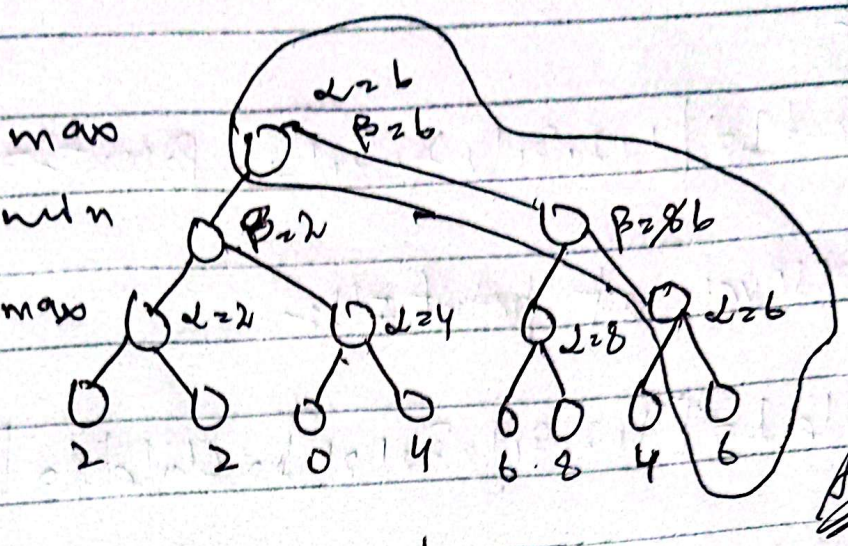
Q.4) O's turn



'X' will choose the rightmost block to maximize its utility.

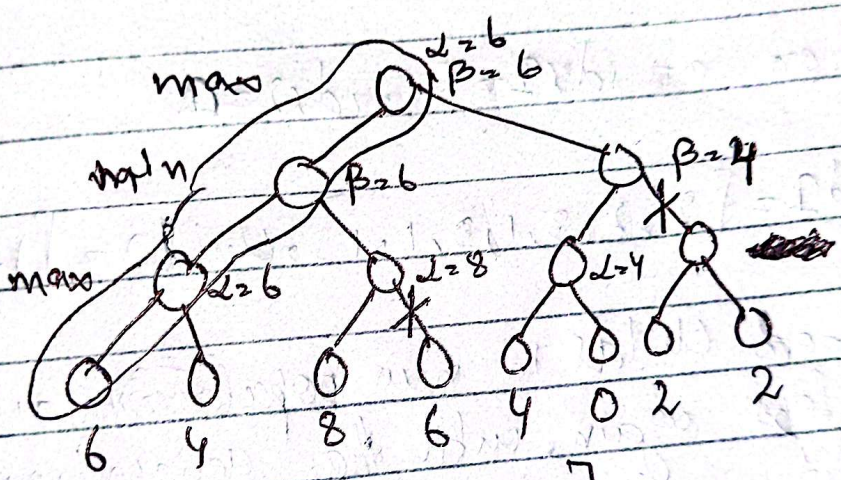
Q.5)

A)



Ans

B)



Pruned Values = [6, 2, 2]

Ans

Q.6)

a) 1) Defender: Seeks to enhance their security and expand their influence
Attacker: Focuses on maximizing the impact of their attacks on the system.

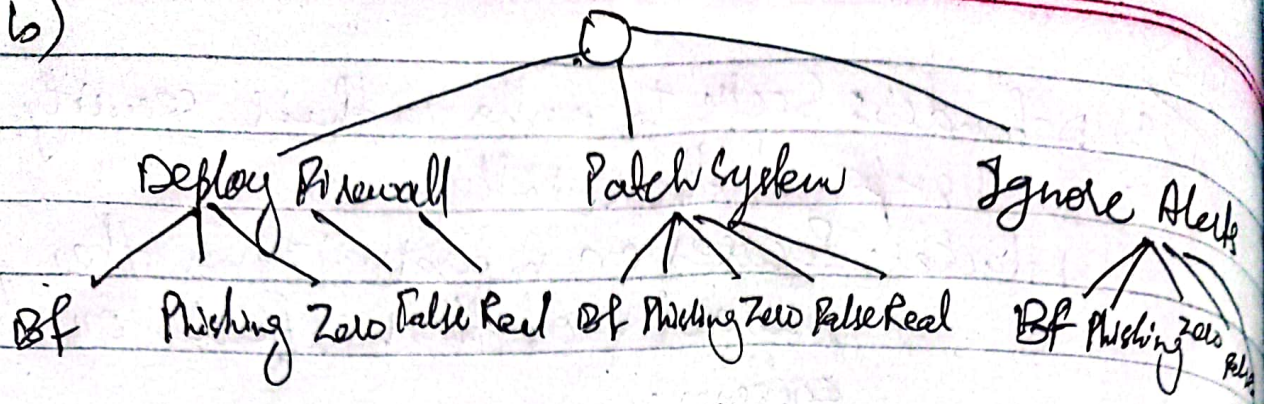
2) The defender works to strengthen their position while reducing the attackers opportunities.
- The Attacker looks for weaknesses in the defender's strategy to exploit.

3) - In predictable scenerios, the defender follows a set strategy.
- When randomness is involved, the defender assesses probabilities and explores various strategies.

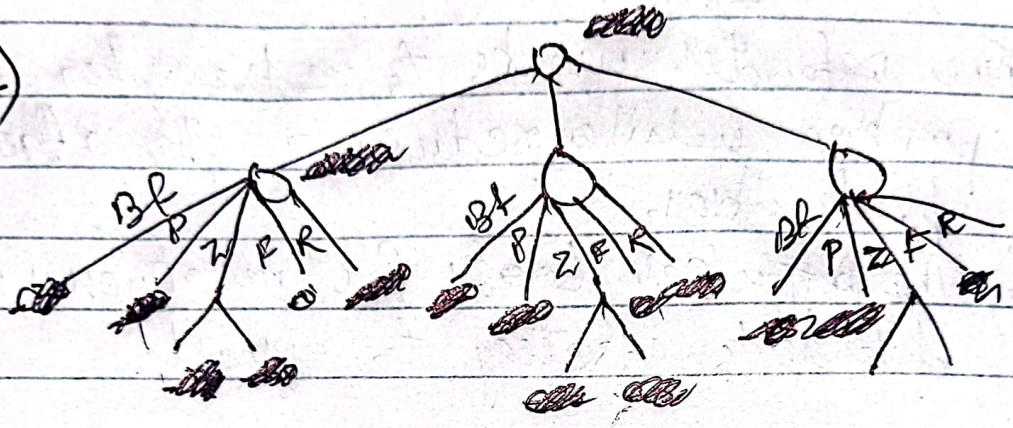
d) 1) Calculations:-
Initial Formula: $-50 \times 0.5 + 45 \times 0.5 = -2.5$
using pstale: $-60 \times 0.5 + (-100) \times 0.5 = -80$
using ignore: $-80 \times 0.5 + (-20) \times 0.5 = -50$

2) The defender used expected value as a final benchmark for decision making, treating it as a direct evaluation tool rather than a transitional place.

b)



c) 1)



2) The actual attack caused significantly more damage upon assessment, while all other attempted attacks were ineffective and resulted in minimal attack.