

## AI - Assignment - 02

Q2)

a- Initial population

$[ [1, 2, 2, 2, 2, 2], [2, 2, 3, 1, 3, 1, 1], [2, 3, 3, 1, 1, 1, 1],$   
 $[3, 2, 2, 3, 3, 1, 1], [3, 1, 2, 3, 2, 1, 1], [1, 1, 1, 3, 1, 3, 1] ]$

b- Fitness

$[-522, -501, -10535, -500, -516, -80538]$

Since the goal is to minimize cost & time, a higher value (less negative) means lower fitness

c- Weights

$[80017, 80038, 70004, 80039, 80023, 1]$

Formula:  $\forall f \in \text{fitness } [f + \text{abs}(\min(\text{fitness})) + 1]$

Eg  $\leftarrow 80023$

$-516 + 1 - 80538 + 1 = 80023$

d- Selection

Parent 1 =  $[3, 2, 2, 3, 3, 1, 1]$

Parent 2 =  $[3, 2, 2, 3, 3, 1, 1]$

e- Crossover

Child 1 =  $[3, 2, 2, 3, 3, 1, 1]$

Child 2 =  $[3, 2, 2, 3, 3, 1, 1]$

f- Mutation

Child 1 =  $[3, 2, 2, 1, 3, 3, 1]$

Child 2 =  $[2, 3, 2, 3, 3, 1, 1]$

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Q4)

X		
X		
O	O	



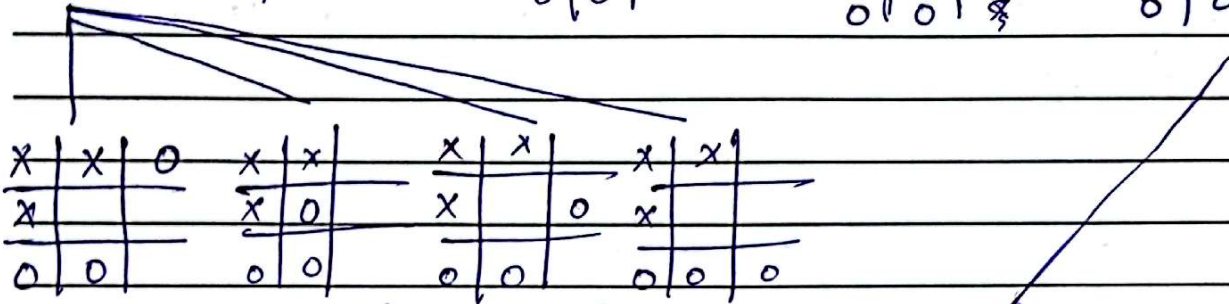
X	X	
X		
O	O	

X		X
X		
O	O	

X		
X	X	
O	O	

X		
X		X
O	O	X

X		
X		
O	O	X



-190

-100

-10

 $V = -1000$ 

X	O	
X		
O	O	X

X		O
X		
O	O	X

X		
X		
O	O	X

X		
X		O
O	O	X

10

0

-180

90

X will choose rightmost block

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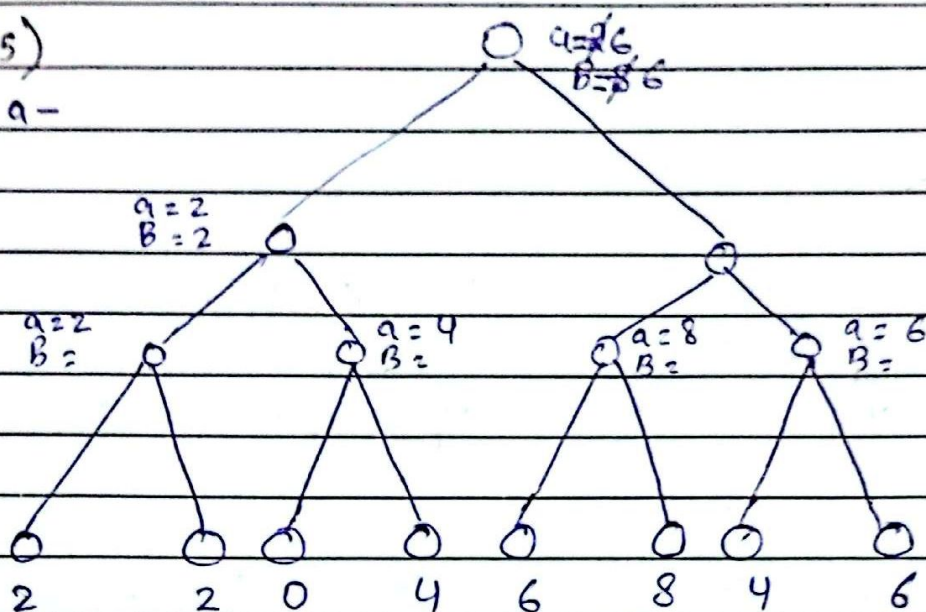
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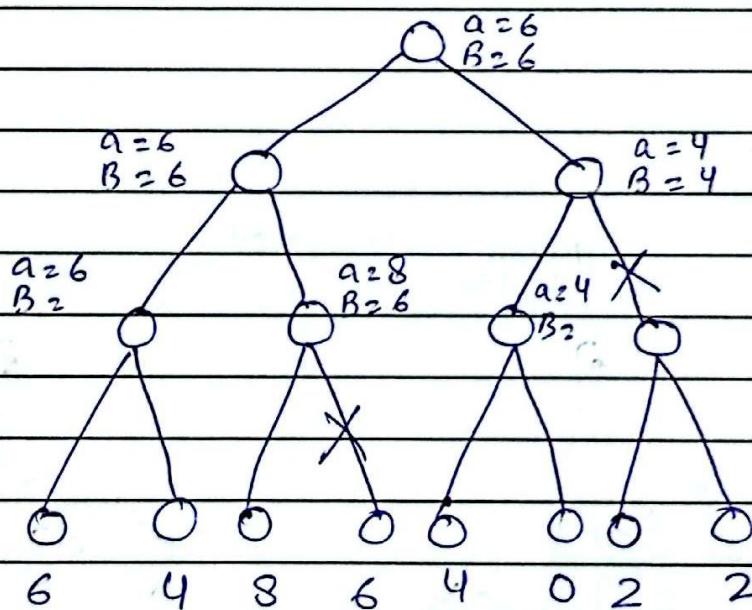
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Q5)

a-



b-



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Q6)

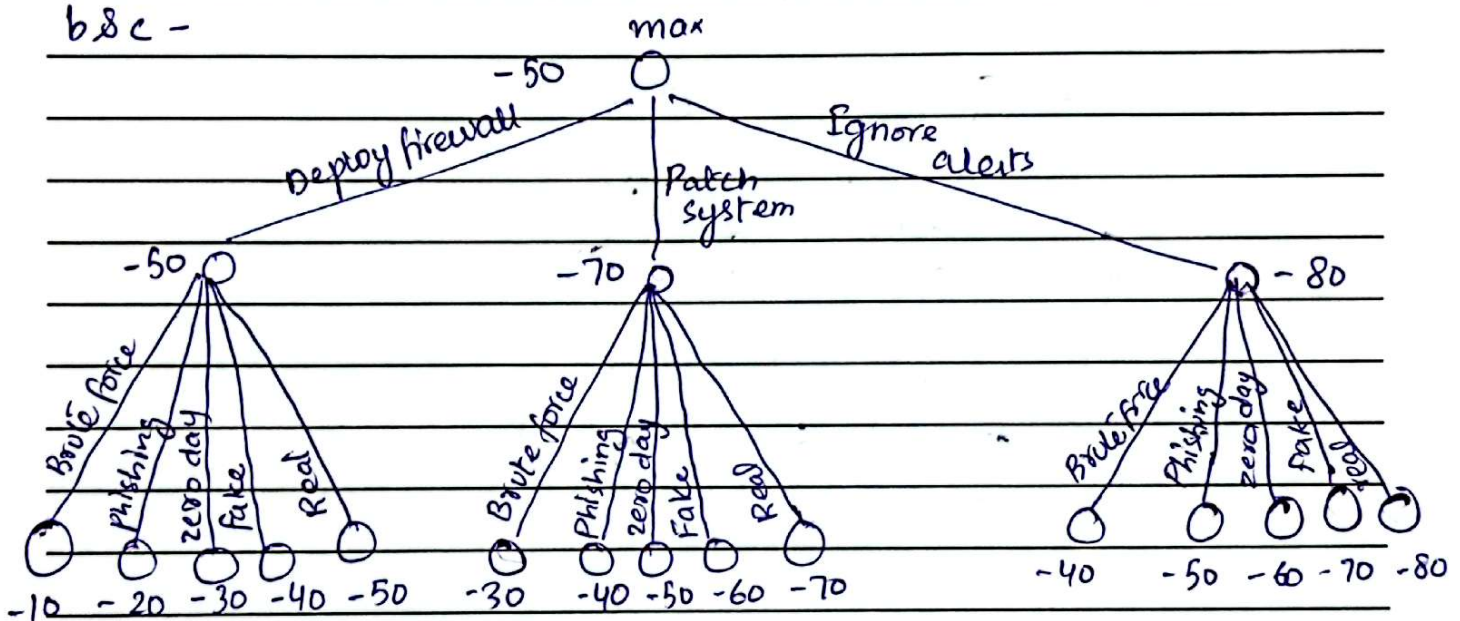
a i) Attacker: Seeks to compromise or breach the system  
 Defender: Aims to protect & secure the system

ii) The defender aims to gain & maintain an advantage, reducing the attacker's effectiveness

The attacker conducts checks to identify & exploit weaknesses in the defender's strategy

iii) With stochastic elements, defenders consider multiple strategies based on probability

b &amp; c -



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