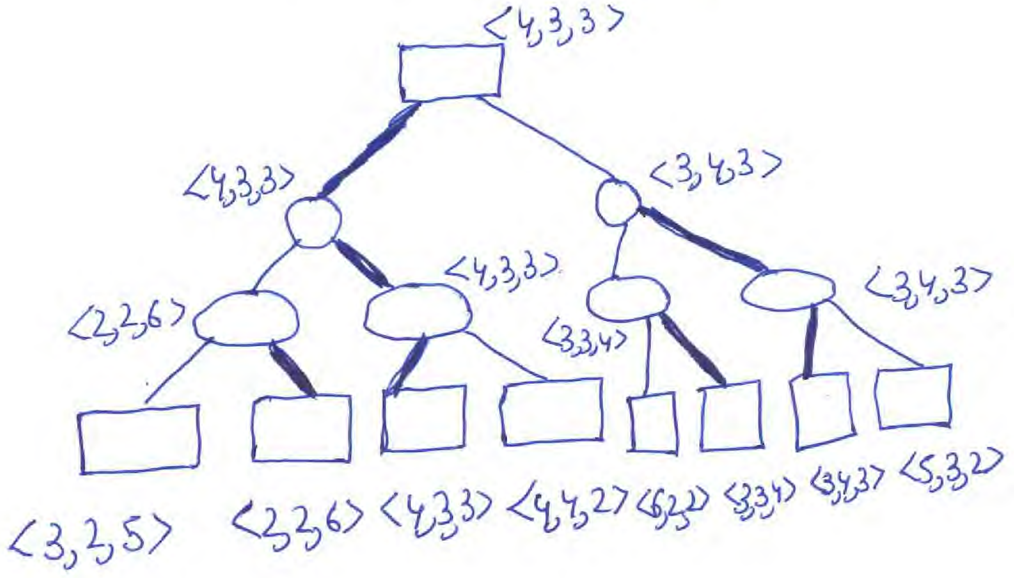
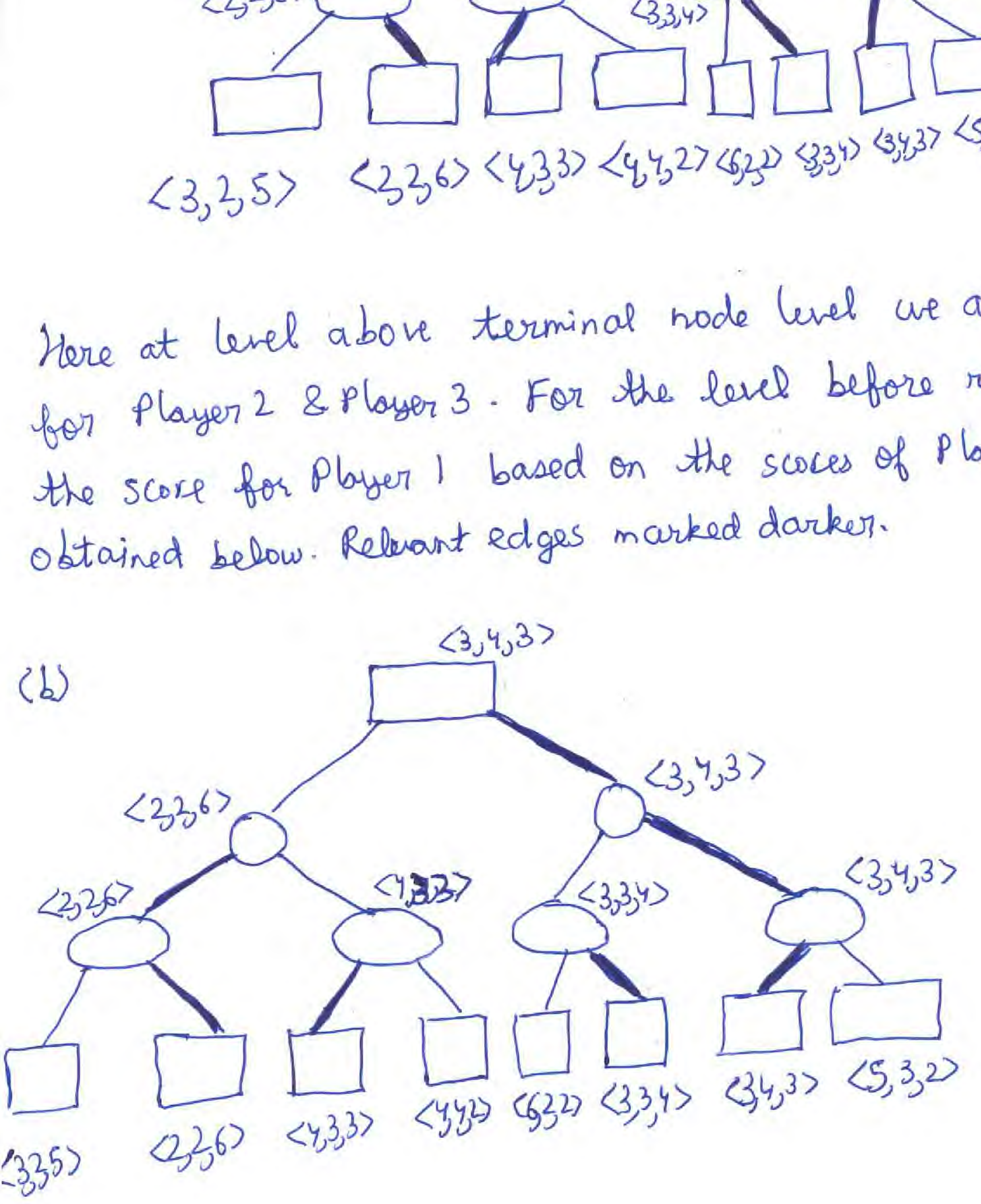
Assignment 2

1. (a) For max payoff, the following will be the game tree paths:



Here at level above terminal node level we are maximising the score for Player 2 & Player 3. For the level before root, we will be max^ng the score for Player 1 based on the scores of Player 2 and Player 3 obtained below. Relevant edges marked darker.

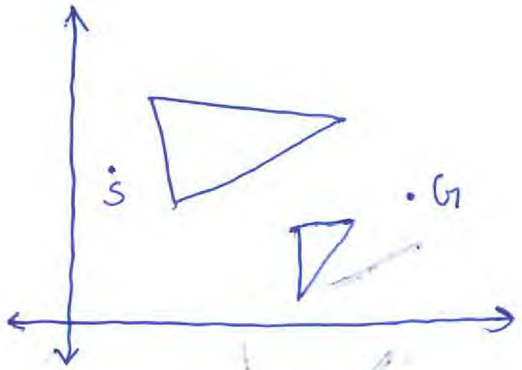
(b)



At every level of tree, Player 2 & Player 3 are trying to minimise the payoff of Player 1. Relevant edges are marked darker.

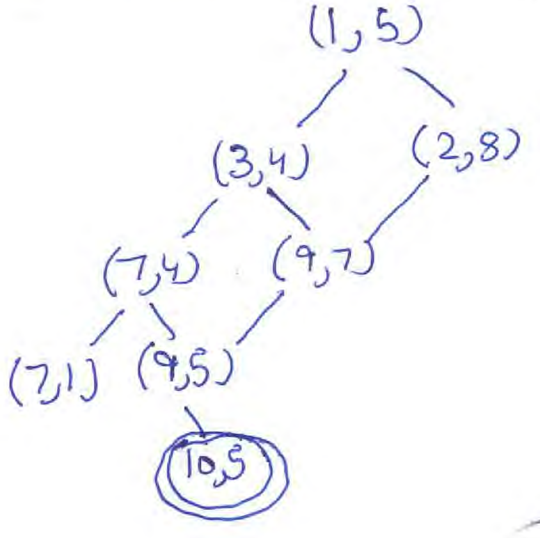
2.
(a)

For the robot plane we have



S(1,5) D(2,1)
A(2,8) E(9,8)
C(7,1) G(10,5)

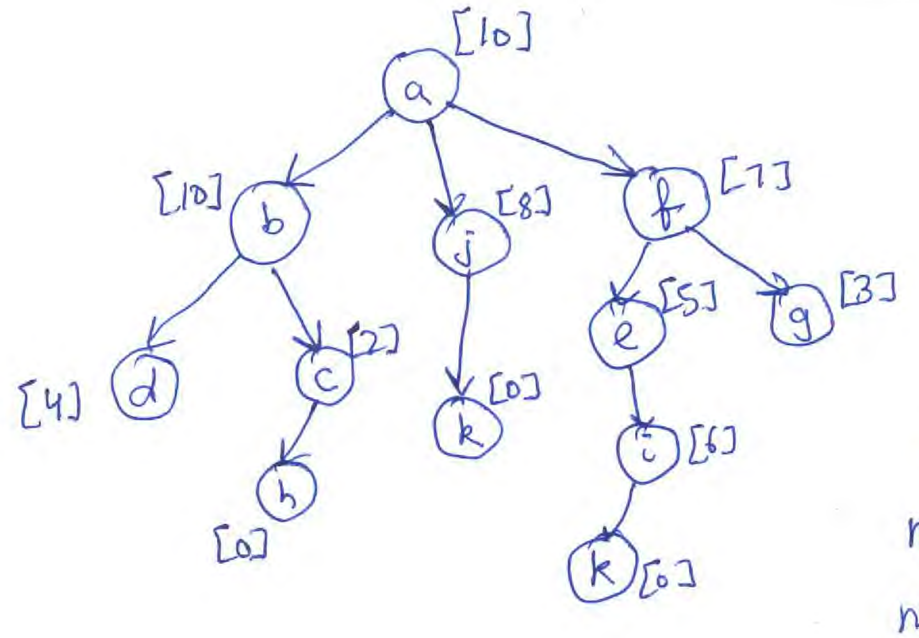
The points will form a Hexagonal plane All points in this b
to the State Space.
Paths will be from start to states in the hexagonal plane w
tend to the goal and the obstacles are the sub regions of th
hexagonal plane. The game tree for it is as follows:



→ When considering obstacles, we to the goal state (10,5) with following pts. and successors a level of it.

b) If Hill Climbing used, then the obstacles are non convex as t are not bounded so it would ~~[illegible]~~ stuck at a ~~[illegible]~~ local maxima would find a path which would ~~not~~ be a local minima/maxima it would not be the shortest path.

We can take example of a tree like path. Start no will be there and it will traverse to the goal state.



h, k are goal states as heuristic f^n evaluated at them is 0.

Here the tree represents non convex polygon as it is not bounded.
So here if local maxima is G, the hill climb algorithm gets stuck. Here we can't backtrack from node G so get stuck.

Assignment 3

(a) Post image set computation we have T as transition function and p as start state.

Here $p = (\neg x \wedge \neg y)$

$T = \{(\neg x \wedge y) \vee (x \wedge \neg y)\}$

Post image $(p) = (\neg x \wedge \neg y) \vee \{(\neg x \wedge y) \vee (x \wedge \neg y)\}$
as $(p \vee T)$

$= \{(\neg x \wedge \neg y) \vee (\neg x \wedge y)\} \vee ((x \wedge \neg y) \vee (\neg x \wedge \neg y))$

$= \{(F, T), (T, F)\}$

So we obtain the next state from the initial state.

For forward computability, we follow the below steps:

$Z_1 = Z_0 \cup T$

$Z_2 = Z_1 \cup T$ Here we are including Z_0, Z_1 states in Z_2

$\vdots$

$Z_n = Z_{n-1} \cup T$ This goes till we are getting $(Z_n = Z_{n-1})$

Then it is terminated & goal state is reach

So here our $Z_1 = \{\{(\neg x \wedge \neg y) \vee (\neg x \wedge y)\} \vee \{(x \wedge \neg y) \vee (\neg x \wedge$

Union with $T = \{(\neg x \wedge y) \vee (x \wedge \neg y)\}$

$Z_2 = Z_1 \cup T$

$= (\neg x \wedge \neg y) \vee 1$

$= (T, T)$