Name :

SC Code :

CREDIT / AUDIT.

1) Consider a room which is split up into cells as shown in Figure 1. There is a robot R in the room placed in the cell as shown. The robot is able to move from a cell to an adjacent cell, which is either to the top, bottom, left, or right of the cell it is currently in. The robot cannot move diagonally and it cannot leave the room.

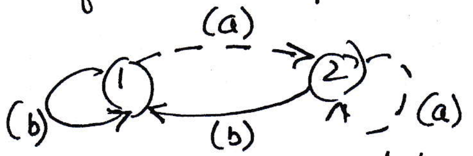
1	2	3	G	1
4	∞	∞	∞	3
3	∞	∞	1	4
1	3	1	3	5
R	2	1	1	1

Figure 1.

Whenever the robot enters a cell (at location (i, j) in the diagram above it needs to pay a cost (denoted by c_{ij}). The value of the cost is shown within the cell in the above figure. (i.e. c_{ij}'s value is shown). The robot needs to move from its starting location (R) to a goal location (G) shown in the figure. The total cost of moving from R to G is the sum of the costs of the cells that the robot moves to when going from R to G. Assuming that the positions R and G have zero cost, find out what sequence of cells should the robot ~~visit~~ move along, so that it can move from R to G with minimum cost.

(PTO).

2) Recall the notations that we have used in class.
Let the $F(\cdot)$ function be specified using the transition diagram shown. The transitions under actions a and b are labelled.



Let $R_t(s, A) = R(s, A)$ and be specified by the table below.

S	A	R(s, a)
1	a	1
2	a	3
1	b	2
2	b	1

Solve the problem $\max \sum_{t=0}^{2} R_t(S_t, A_t)$

$S_0 = 1, \quad S_{t+1} = F(S_t, A_t)$

using Dynamic programming.