Problem 2(a):

File attached

Problem 2(b):

```
Value Iteration:
Optimal Policy:
[ 1  3  1  2  1  1  1  2  3  1  1  2  3  3 -1  2]
Number of Iterations: 60
Optimal Value Function:
[0.06888624 0.06141117 0.07440763 0.05580502 0.09185097
0.
 0.11220727 0.         0.14543392 0.24749561 0.29961676
0.
 0.         0.37993504 0.63901974 0.         ]
Policy Iteration:
Optimal Policy :
[0 3 0 3 0 0 0 0 3 1 0 0 0 2 1 0]
Number of Iterations: 61
Number of Iterations: 2
```

0 - Up
1 - bottom
2 - left
3 - bottom

Problem 2(c):

No, there are no stochastic optimal policies as a probability of 1 is given when it goes from state s to s' while performing action a and the other actions are given a probability of 0.

Problem 2(d):

(i) File attached

(iii) There will be a change in optimal path due to scaling down of gamma as this is a stochastic environment.