The following was the output when the Discount factor was 0.1
a)

0	6.5	0	-1.381	65.0	0
1	-6.112	-7.132	-6.692	-1.381	0
2	-7.132	-7.214	0	-6.746	0
3	-7.215	-7.221	-13.0	-7.217	0
4	0	0	0	0	0

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Since the discount factor is less, so the reward keeps diminishing with time and hence, the program converges to a negative value, taking only 6 iterations.

b) The following is the output of the code when discount factor was 0.99

0	6.5	0	55.119	65.0	0
1	25.668	37.409	47.293	55.119	0
2	19.158	27.774	0	46.327	0
3	11.311	15.33	-13.0	32.08	0
4	0	0	0	0	0

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Here, the discount factor is very high, so the program undergoes a lot of iterations and converges finally to a high positive value.

2. **This part b**

a)

0	6.5	0	6499.99	65.0	0
1	6499.99	6499.99	6499.99	6499.99	0
2	6499.99	6499.99	0	6499.99	0
3	6499.99	6499.99	-13.0	6499.99	0
4	0	0	0	0	0

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<u>Since the step cost is very high, the bot gets a great reward at each step and hence tries to take a long route to try and accumulate the highest possible reward value. This results in a very massive final utility value.</u>

b)

0	6.5	0	46.136	65.0	0
1	-4.432	12.374	31.195	46.136	0
2	-18.943	-5.633	0	29.351	0
3	-33.504	-22.065	-13.0	9.943	0
4	0	0	0	0	0

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c)

0	6.5	0	41.644	65.0	0
1	-12.328	-0.053	23.147	41.644	0
2	-31.236	-21.514	0	20.863	0
3	-48.99	-31.827	-13.0	-1.125	0
4	0	0	0	0	0

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d)

0	6.5	0	41.644	65.0	0
1	-12.328	-0.053	23.147	41.644	0
2	-31.236	-21.514	0	20.863	0
3	-48.99	-31.827	-13.0	-1.125	0
4	0	0	0	0	0

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For parts, (b), (c) and (d) the step cost keeps decreasing. This results in lesser iterations and also a lesser utility value on convergence.