





2LT 2T 25 22 2LT The world has the following set of actions  $A = \{ \rightarrow, \leftarrow \}$ , where: >= The agent moves to the right with probability of 0.8 and to the left with prob. of 0.2 4 = The agent moves to the left with probability of 0.8 and to the right with prob. of 0.2 The remard function  $f_0(s,a,s_f) = f_0(s_f)$  only depends on the state to which the agent arrives and is defined as: That is, if the agent goes from s, to s2 then it receives -0.4 -10 0 -0.4 -0.4 10 of reward that is defined in state Do as follows: a) Build the graph of the world So lution b) Write the transition function PMT (SFISIA) Solution The non-deterministic transition function is St ~ PMT (St | Sta) = St. 1 1 S, 0.2 0.8 S, 0.2 0.05 S, 0.2 0.05 S, 0.2 0.05 
 S1
 0.2
 0.8
 S1
 0.2
 0.8
 S2
 0.2
 0.8
 S2
 0.2
 0.8
 S2
 0.2
 0.9
 S2
 0.2
 0.9
 S3
 0.2
 0.9
 S3
O O S3 0 0 SF2 0 0 SF2 0 0 c) Write the reward function fo(s,a,sf) = fp(sf) Solution S + - 52 a a a a ) Write two action functions for(s): i. One so that the agent, from the initial state, orrives to SFz (final state). So lution Peterministic action tion a= fr(s). Thus, from the initial state to SF2, a = f (s) = SF,

ii. One so that the agent, from the initial state, arrives to SF, (final state). Solution Thus, from Initial state Si, to arrive to SF, the action function is  $O_1 = f_{TT}(s) = S_{F_1}$   $S_1$   $S_2$   $S_3$   $S_4$   $S_5$   $S_6$   $S_{F_2}$  Nonee) Show the probability of the agent arriving at the final state sF2 and at the final state st, in both politics of question d. Solution  $\begin{array}{c} S_1 \rightarrow S_2 & \rho = 0.8 \\ S_1 \rightarrow S_3 & \rho = 0.8 \\ S_3 \rightarrow S_{72} & \rho = 0.8 \end{array}$ i) To SF2  $P(S_1 \rightarrow S_2 \mid S_1)$  $P(S_1 \rightarrow S_1 \mid S_2)$   $P(S_1 \rightarrow SF_2 \mid S_3) = (0.8)(0.8)(0.8)$ = 0.512 ii) To sF, = S, → SF, = OR  $P(S_i \rightarrow SF_i \mid S_i) = 0.8$