CS7641 ML Practice Quiz

Module RL 1: Markov Decision Processes

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Question 1

What is a Markov Decision Process (MDP) primarily used for in reinforcement learning?
A. To model deterministic environments where the outcome of each action is predictable.
B. To represent decision-making scenarios that involve uncertainties and probabilistic outcomes.
C. To optimize linear transformation algorithms for feature selection.
D. To directly learn the policy which maps states to actions without using value functions.
E. To solve problems where the transition and reward functions are known in advance.

Question 2

In the context of MDPs, what does the Markovian property imply about the transition function?
A. It depends on the entire history of past states and actions.
B. It only depends on the current state and not on any past states.
C. It is always deterministic and can be predicted with complete accuracy.
D. It is irrelevant as long as the reward function is well-defined.
E. It changes over time and does not maintain stationarity.

Question 3

What is the purpose of introducing stochasticity (uncertainty) in actions within a Markov Decision Process?
A. To simplify the computation of the optimal policy.
B. To model real-world scenarios where actions do not always lead to predictable outcomes.
C. To ensure that all actions have the same probability of success.
D. To eliminate the need for a transition model in decision-making.
E. To focus solely on immediate rewards rather than long-term outcomes.

Question 4

How is the utility of a sequence of states in an MDP typically calculated?

A. By counting the number of states visited.
B. By multiplying the rewards of each state.
C. By adding up all the rewards received in those states.
D. By averaging the rewards over the total number of states.
E. By considering only the rewards of the final state in the sequence.

Question 5

What is the primary goal of using discounted rewards in Markov Decision Processes?

A. To increase the importance of immediate rewards over future rewards.
B. To ensure that the sum of rewards over an infinite sequence is finite.
C. To prioritize actions that lead to higher rewards in the shortest time.
D. To eliminate the need for a policy in decision-making.
E. To simplify the calculation of the transition model in an MDP.

Answer Key

1. B
2. B
3. B
4. C
5. B

Answer Key

1. A
2. C
3. B
4. B
5. B