LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **DATA SCIENCE**

THIRD SEMESTER – **NOVEMBER 2022**

PDS 3602 – REINFORCEMENT LEARING

Date: 02-12-2022   Dept. No.   Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

PART – A

Q. No. Answer ALL questions   **(10 x 2 = 20 Marks)**

1   What are the two policies in Off-Policy Monte Carlo Prediction?

2   Define Importance Sampling.

3   What is batch updating?

4   Define Afterstates.

5   List out the four benefits of Eligibility Traces.

6   What are the three ways that TD (λ) improves over the offline λ-return algorithm?

7   Define Function Approximation in Reinforcement Learning.

8   List out the feature construction for linear methods.

9   Define Policy Gradient Methods.

10   What is the difference between Gradient Ascent and Gradient Descent?

PART – B

Answer ALL questions   **(5 x 8 = 40 Marks)**

11   (a) State and explain the key characteristics of Monte Carlo Method.

or

(b) Describe the perception on rollout algorithms in detail with an example.

12   (a) Define Temporal Difference Prediction and list out its advantages in detail.

or

(b) Explain the Q-Learning in off-policy Temporal Difference Control with backup diagram.

13   (a) Explain the concept of n-step TD prediction method with backup diagram.

or

(b) Describe the concept of Watkins's Q(λ) method with backup diagram.

14 (a) Explain the concept of Control Algorithms in detail.

or

(b) Describe the concept of Fitted Iterative Methods in detail.

15 (a) Explain the concept of REINFORCE algorithm and it steps in detail.

or

(b) Describe the concept of actor-critic methods in detail with neat illustration.

PART – C

Answer any TWO questions   **(2 x 20 = 40 Marks)**

16 Explain the following:

    (a)   Every Visit Monte Carlo method with an example.

    (b)   SARSA – On Policy Temporal Difference Learning method with backup diagram.

17 Write a short note on the following:

    (a)   TD (λ) –Forward and Backward Views.

    (b)   Gradient Descent Methods.

18 Describe the following topics:

    (a)   Asynchronous Advantage Actor-Critic Method.

    (b)   TDGammon Case Study in Reinforcement Learning.

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