

Seat No. **MAR_APR 2025 SUMMER EXAMINATION****11731 Bachelor of Technology (NEP-2.0)****Sub. Name: Reinforcement Learning****Sub. Code: 56521****Day and Date: MAY ,08-05-2025****Total Marks: 70****Time: 10:30 AM To 01:00 PM****Instructions:**

- Special Inst.:**
1. Question no. 6 is compulsory
 2. Solve any four questions from Q. No. 1 to Q. No.5
 3. Assume suitable data wherever necessary
 4. Figures to the right indicate full marks

- Q1)** Solve the following questions [15]
- a. Describe the process of value iteration in dynamic programming. [8]
 - b. Discuss the differences between policy iteration and value iteration. [7]
- Q2)** Solve the following questions [15]
- a. Compare TD(λ) and Monte Carlo methods in terms of bias and variance [8]
 - b. What is function approximation in reinforcement learning? [7]
- Q3)** Solve the following questions [15]
- a. How does the REINFORCE algorithm use function approximation in policy gradients? [8]
 - b. Define the MAXQ framework in hierarchical reinforcement learning. [7]
- Q4)** Solve the following questions [15]
- a. Explain the key components of a Markov Decision Process (MDP). [8]
 - b. Describe the exploration-exploitation dilemma in reinforcement learning. Why is it essential to balance these two strategies? [7]
- Q5)** Solve the following questions [15]
- a. Discuss the Bellman equations for state value and action value functions in the context of MDPs. [8]
 - b. What are multi-armed bandit problems, and how do they relate to the [7]

exploration-exploitation dilemma?

Q6) Write short note(Any 2)

[10]

- a. generalized policy iteration (GPI) in reinforcement learning
- b. ϵ -Greedy algorithm in reinforcement learning
- c. ϵ -Greedy algorithm in reinforcement learning

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (56521) Reinforcement Learning Part 4 SEM 7