

Seat No. **OCT-NOV 2025 WINTER EXAMINATION****1154 B.Tech. CBCS****Sub. Name: Reinforcement Learning****Sub. Code: 56521****Day and Date: Monday ,08-12-2025****Total Marks: 70****Time: 02:30 PM To 05:00 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. Explain the key components of a Markov Decision Process (MDP). **[8]**
 - b. Compare and contrast reinforcement learning with supervised and unsupervised learning. **[7]**
- Q2)** Solve the following questions **[15]**
- a. What are multi-armed bandit problems, and how do they relate to the exploration-exploitation dilemma? **[8]**
 - b. Discuss the differences between policy iteration and value iteration. **[7]**
- Q3)** Solve the following questions **[15]**
- a. Describe the concept of adversarial bandits. How do they differ from traditional bandit problems? **[8]**
 - b. What is an eligibility trace in the context of reinforcement learning? **[7]**
- Q4)** Solve the following questions **[15]**
- a. Explain the backward view of eligibility traces **[8]**
 - b. Compare TD(λ) and Monte Carlo methods in terms of bias and variance **[7]**
- Q5)** Solve the following questions **[15]**
- a. How is feature selection important in function approximation? **[8]**
 - b. How does the REINFORCE algorithm use function approximation in policy **[7]**

gradients?

- Q6)** Write a short note on: (Any 2) **[10]**
- a.** ϵ -Greedy algorithm in reinforcement learning **[5]**
 - b.** generalized policy iteration (GPI) in reinforcement learning **[5]**
 - c.** limitations of traditional reinforcement learning methods **[5]**

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