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**BT-8/M-24: 48400-SE**  
**PC-CS-AIDS- 402A Reinforcement Learning**

**Time: 3 hours]****[Max. Marks: 75**

**Note:** Attempt five questions in all, selecting at least one question from each unit.

**UNIT-I**

1. What is Reinforcement Learning. Explain elements of reinforcement learning in detail. 15

2. How does Reinforcement Learning work. State one practical example. 15

**UNIT-II**

3. What is the Bellman Equation? How is it helpful in RL? 15

4. What is difference between Markov property and Markov chain. Explain Markov Decision Process in detail. 15

**UNIT-III**

5. Write short note on the following :

(i) SARSA

(ii) Q-learning and their variants in detail 15

6. Discuss Monte Carlo methods for model free prediction and control in detail. 15

**UNIT-IV**

7. What is Gradient MC and semi-gradient TD(0) algorithms. Discuss in detail. 15

8. Explain all function approximation methods in Reinforcement Learning. 15

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BT-8/M-24

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## REINFORCEMENT LEARNING

Paper-PC-CS-AIDS-402A

Time Allowed : 3 Hours]

[Maximum Marks : 75

**Note** : Attempt five questions in all, selecting at least one question from each Unit. All questions carry equal marks.

### UNIT-I

1. Define Reinforcement Learning. Discuss connection of Reinforcement Learning with other areas of Machine Learning. 15
2. State key terms used Reinforcement Learning. 15

### UNIT-II

3. Explain the Bellman Optimal Policy equation in detail. 15
4. How to represent the Agent State ? Differentiate between State-value function and Action-value function. 15

### UNIT-III

5. What is Monte Carlo prediction method in Reinforcement Learning ? 15



6. What is Temporal Difference Learning ? Explain all Temporal Difference Learning variants. 15

#### UNIT-IV

7. What are the eligibility traces and how do they address the challenges of delayed rewards in Reinforcement Learning ? 15
8. Explain Gradient descent algorithm in Machine learning. 15