R22 Regulation *Subject code: 4P8HB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VIII Semester Regular Examinations, May 2026

Reinforcement Learning

(CSE(DS))

Maximum Marks: 60 Date:04.05.2026 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	BTL
1.a)	Define Reinforcement Learning.	1	1	1
b)	What is a Markov Decision Process?	1	1	2
c)	Define Bellman Equation.	1	2	1
d)	What is Exploration vs Exploitation?	1	2	2
e)	Define Q-Learning.	1	3	1
f)	What is Temporal Difference Learning?	1	3	2
g)	Define Policy Gradient Method.	1	4	1
h)	What is Actor-Critic architecture?	1	4	2
i)	What is Model-Based Reinforcement Learning?	1	5	2
j)	Define Multi-Agent Reinforcement Learning.	1	5	1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) Explain the Reinforcement Learning framework with a neat diagram. b) What is the role of reward signals in learning optimal policies.	5 5	1	2
	OR			
3	Describe Exploration vs Exploitation trade-off strategies with examples.	10	1	2
4	Discuss Monte Carlo methods with example.	10	2	3
	OR			
5	Explain Q-Learning and SARSA algorithms.	10	2	2
6	Discuss Vanilla Policy Gradient method.	10	3	3
	OR			
7	Explain Actor-Critic methods (A2C, A3C).	10	3	2
8	Explain Model-Based Reinforcement Learning approach.	10	4	2
	OR			
9	Explain model-based policy optimization.	10	4	2
10	Explain Meta-Learning in Reinforcement Learning.	10	5	2
	OR			
11	Discuss ethical issues and real-world applications of RL.	10	5	3