

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

May-June 2024		
B.Tech. Program: Artificial Intelligence and Data Science , Scheme /II/IB/III-T		
Regular Examination: LY Semester: VIII		
Course Code: AIC801 and Course Name: Reinforcement Learning		
Date of Exam: 14/05/2024	Duration: 2.5 Hours	Max. Marks: 60

Instructions: (1) All questions are compulsory. (2) Draw neat diagrams wherever applicable. (3) Assume suitable data, if necessary.				
		Max. Marks	CO	BT level
Q 1	Solve any six questions out of eight:	12		
i)	Define the terms "reward" and "policy" in the context of RL.	2	CO1	R
ii)	What are the advantages of Q-learning?	2	CO2	U
iii)	What are the benefits and applications of temporal difference learning?	2	CO2	U
iv)	Explain the concept of activation functions in deep learning.	2	CO3	U
v)	What is environment engineering in RL engineering?	2	CO4	R
vi)	Draw the reinforcement learning project life cycle.	2	CO4	U
vii)	List the advantages and potential applications of meta-learning in reinforcement learning.	2	CO5	U
viii)	Define dynamic channel allocation in the context of wireless communication.	2	CO6	U
Q.2	Solve any four questions out of six.	16		
i)	Discuss scope and limitations of reinforcement learning.	4	CO1	U
ii)	Describe the epsilon-greedy strategy and its application in Multi-arm Bandit problems.	4	CO2	U
iii)	Name some popular deep learning frameworks and briefly explain any two frameworks.	4	CO3	U
iv)	Explain benefits of learning policy directly.	4	CO4	U

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v)	Discuss the challenges and benefits of transfer learning in reinforcement learning.	4	CO5	U
vi)	Explain the potential benefits of using RL in elevator dispatching systems.	4	CO6	Ap
Q.3	Solve any two questions out of three.	16		
i)	Explain the role of the state, action, and reward in the RL framework. Discuss a scenario in which reinforcement learning is applied in game playing systems.	8	CO1	Ap
ii)	Explain the concept of container scaling in the context of application deployment. What are the main challenges addressed by automatically scaling application containers?	8	CO2	Ap
iii)	State the Policy Gradient Theorem and its significance in reinforcement learning.	8	CO4	U
Q.4	Solve any two questions out of three.	16		
i)	What is experience replay, and how does it address certain challenges in training deep Q-learning models? Explain the role of a replay buffer in experience replay.	8	CO3	U
ii)	Explain the concept of state engineering in reinforcement learning. Discuss the challenges and considerations involved in choosing an appropriate state representation for a given problem.	8	CO4	U
iii)	Discuss emerging trends or future directions in meta-learning, multi-agent reinforcement learning, POMDPs, and ethics in RL.	8	CO5	U
