04/07/22 (A)

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

Subject Code: 1PCEC201 Subject Name: Deep and Reinforcement Learning Date: 04/07/2022

April – May 2022
**M.Tech(AI) Program: Computer Engineering**
Examination: FY Semester: II
Course Code: **1PCEC201** and Course Name: **Deep and Reinforcement Learning**

Duration: 03 Hours Max. Marks: 60

Instructions:
(1) All questions are compulsory.
(2) Draw neat diagrams wherever applicable.
(3) Assume suitable data if required, and state it clearly.

| | | Max. Marks | CO | BT Level |
|---|---|---|---|---|
| **Qu-1** | Solve any **Six** questions out of **Eight.** | **12** | | |
| **i)** | What are the steps involved in a typical Reinforcement Learning algorithm? | **2** | CO2 | Understand |
| **ii)** | What is the "deep" in deep learning? | **2** | CO1 | Understand |
| **iii)** | What do you mean by capacity of model? How it is used to handle the overfiting or underfiting? | **2** | CO3 | Understand |
| **iv)** | Explain the Convolution Operation. | **2** | CO4 | Understand |
| **v)** | List and explain elements of Reinforcement Learning. | **2** | CO5 | Understand |
| **vi)** | Why do we prefer Convolutional Neural networks (CNN) over Artificial Neural networks (ANN) for image data as input? | **2** | CO4 | Apply |
| **vii)** | What is recurrent neural network in deep learning? How do recurrent neural networks work? | **2** | CO4 | Understand |
| **viii)** | What Are the Applications of a Recurrent Neural Network (RNN)? | **2** | CO6 | Remember |
| **Qu-2** | Solve any **Four** questions out of **Six.** | **16** | | |
| **i)** | What is Reinforcement Learning? How does it compare with other ML techniques? | **4** | CO5 | Analyze |
| **ii)** | What is ReLU activation? Explain the significance of the ReLU Activation function in Convolution Neural Network. | **4** | CO1 | Apply |
| **iii)** | What are bidirectional RNNs used for? How does bidirectional RNN work? | **4** | CO4 | Apply |
| **iv)** | Explain learning to play tic-tac-toe that learned something much more like a state-value function for selecting moves. | **4** | CO6 | Understand |
| **v)** | What are deep feedforward networks? What does feed forward network do? | **4** | CO2 | Understand |
| **vi)** | Explain L1 regularization. | **4** | CO3 | Understand |

| | | | | |
|---|---|---|---|---|
| **Qu-3** | Solve any **Two** questions out of **Three.** | **16** | | |
| **i)** | What is the importance of Sampling? Explain with Monte Carlo Methods. | **8** | CO5 | Understand |
| **ii)** | What is multi-armed bandit problem? Why the multi-armed bandit problem is a generalized use case for reinforcement learning? How can we solve multi arm bandit problem? Explain. | **8** | CO4 | Understand |
| **iii)** | Explain the conversational systems or dialog systems (a chatbot) that can freely converse with a human about a variety of topics in a natural way. | **8** | CO6 | Understand |
| **Qu-4** | Solve any **Two** questions out of **Three.** | **16** | | |
| **i)** | Illustrate the concept of L2 (or weight decay) regularization on the value of the optimal w with suitable diagram. | **8** | CO3 | Apply |
| **ii)** | Explain the agent–environment interaction in a Markov decision process with suitable diagram. | **8** | CO5 | Understand |
| **iii)** | What is the difference between backpropagation and gradient descent? How do you use gradient descent in backpropagation? | **8** | CO1 | Analyze |

**********