SET-I

182

Roll No. | | | | | | | | | |

COER University

END SEMESTER EXAMINATION, EVEN SEMESTER, 2023-24

Time : 3 hour **Semester** : VI **Total Marks: 100**
Program Name : B.Tech **Branch/Specialization** : AI & ML
Course Code : SOC304 **Course Name** : Artificial Neural Network

Note: All questions are compulsory. No student is allowed to leave the examination hall before the completion of the time.

Q. No 1	Attempt Any Four Parts. Each Question Carries 5 Marks.	CO	BL
(a)	Explain the concept of activation function in neural networks and its role.	CO 1	2
(b)	Compare and contrast the structure of an artificial neuron with a biological neuron.	CO 1	3
(c)	Analyze the similarities and differences between Hebbian Learning and other forms of synaptic plasticity mechanisms.	CO 1	4
(d)	Design a neural network architecture incorporating Boltzmann Learning for pattern recognition tasks.	CO 1	3
(e)	Discuss are the main challenges associated with solving the Credit Assignment Problem?	CO 1	2

Q. No 2	Attempt Any Four Parts. Each Question Carries 5 Marks.	CO	BL
(a)	Explain the primary goal of Adaptive Filtering Problem?	CO 2	1
(b)	Analyze the advantages and disadvantages of Linear Least Square Filters compared to other filtering techniques.	CO 2	3
(c)	Propose a scenario where the Least Mean Square Algorithm could be utilized for system identification?	CO 2	3
(d)	Solve XOR Problem,using perceptron learning techniques ?	CO 2	3
(e)	Explain Feature Detection techniques used in Artificial neural network .	CO 2	2

Q. No 3	Attempt Any Four Parts. Each Question Carries 5 Marks.	CO	BL
(a)	Describe the purpose of Cross Validation in machine learning, explain its types?	CO 3	1
(b)	Discuss the computational challenges associated with computing the Hessian matrix.	CO 3	6
(c)	Develop a method for efficiently computing and utilizing the Hessian Matrix in neural network training.	CO 3	6
(d)	Given a neural network architecture, how would you implement back propagation to train the model?	CO 3	3
(e)	Evaluate the applicability of supervised learning in various real-world problem domains.	CO 3	3

Q. No 4	Attempt Any Two Parts. Each Question Carries 10 Marks.	CO	BL
(a)	Compare and Contrast the Kohonen SOM and the Neural Gas Model.	CO 4	2
(b)	Explain the concept of self-organization in the context of feature maps. Describe the fundamental properties of a feature map and their significance in pattern recognition tasks	CO 4	2
(c)	Consider the SOFM network, determine the class membership of the input data :- X1[1010], X2[1000],X3[1111]& X4[0110],each vector of length 4 & 2 output units.	CO 4	5

Q. No 5	Attempt Any Two Parts. Each Question Carries 10 Marks.	CO	BL
(a)	Discuss the fundamental principles underlying Hopfield models in neuro dynamics.	CO 5	2
(b)	Compare and contrast different types of attractors and their significance in neural network dynamics.	CO 5	4
(c)	Evaluate the strengths and limitations of various neuro dynamical models in capturing the complexity of brain dynamics.	CO 5	4

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