School of Computing Science and Engineering

Bachelor of Computer Applications
Semester End Examination - Jun 2024

Duration : 180 Minutes
Max Marks : 100

Sem IV - E1UA403B - Machine Learning

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1)	Discuss the different methods for measuring classifier performance	K1(2)
2)	Identify the significance of data sampling in machine learning. Select one data sampling technique and provide a detailed explanation of its purpose, methodology, and potential benefits	K2(4)
3)	Develop a comprehensive understanding of data preprocessing by defining its purpose and importance. Discuss various techniques used in data preprocessing and also illustrate the applications of each technique.	K2(6)
4)	Examine the different types of clustering algorithms, such as hierarchical clustering, k-means clustering, and density-based clustering. Explain the underlying principles and characteristics of each approach.	K3(9)
5)	Analyze the advantages and disadvantages of clustering algorithms. Discuss challenges such as sensitivity to initial parameters, scalability issues, and the need for domain expertise in interpreting results.	K3(9)
6)	Define overfitting in the context of MLPs. Discuss at least two methods used to prevent overfitting in MLPs, such as dropout, weight decay, or early stopping. Compare their effectiveness and limitations.	K5(10)
7)	Explain the concept of an activation function in a neural network. Why is it important?	K4(12)
8)	For the following set of training samples, find which attribute can be chosen as the root for decision tree classification.	K5(15)
9)	Create a linear regression model using the least squares approach to establish the equation y=ax+b. Calculate the values of the slope 'a' and intercept point 'b' for the regression line. Utilize these values to estimate the value of y when x is equal to 10	K5(15)

S.No.	X	Y
1.	0	2
2.	1	3
3.	2	5
4.	3	4
5.	4	6

10) Discuss the concept of reinforcement learning in AI. Explain how agents learn to make sequential decisions through interaction with an environment, utilizing concepts such as rewards, policies, and value functions. Provide examples of real-world applications where reinforcement learning excels. K6(18)