[Total No. of Questions:] [Total No. of Printed Pages: 01]

LNCT UNIVERSITY, BHOPAL
Enrolment No. .....
CSE- V/ AL/CSE-502
B.TECH - CSE V SEMESTER
EXAMINATION SAMPLE PAPER
Machine Learning

Maximum Marks: 70 **Time Allowed: 3Hours**

Note:- Attempt all questions internal choice are given.

(SECTION –A)

Short Answer Type Question (Attempt Any Five) **[5x6=30]**

1. What is the difference between Supervised and Unsupervised Learning? Give examples.
2. Define Precision and Recall. How are they useful in evaluating classification models?
3. What are the key steps in a Machine Learning workflow?
4. What is the purpose of feature scaling? Explain Min-Max scaling.
5. Differentiate between Bagging and Boosting with one use-case each.
6. Explain PCA and its role in dimensionality reduction.
7. What is the significance of activation functions in neural networks?

(SECTION –B)

Long Answer Type Question (Attempt Any Four) **[4x10=40]**

1. Explain the working of Linear Regression. Derive the cost function and explain how it is optimized using Gradient Descent.
2. Describe in detail the k-Nearest Neighbors (k-NN) algorithm. Discuss how to choose the best k and measure distance between instances.
3. What is Support Vector Machine (SVM)? Explain how SVM separates data using hyperplanes and the concept of margin and kernel tricks.
4. What are Decision Trees and how does the Random Forest algorithm overcome their limitations?
5. Explain the training process of a Multilayer Perceptron (MLP) with backpropagation. Include a diagram and explanation of forward and backward passes.
6. What are overfitting and underfitting? How do techniques like Cross-Validation and Regularization help in mitigating them?