

[This question paper contains 2 printed pages.]

Sr. No. of Question Paper : 1931

Your Roll No.....

Unique Paper code: 2512042402

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Name of the paper: Machine Learning

Name of course: B.Sc(H) Instrumentation

Semester: IV

Duration: 2 Hours

Maximum Marks: 60

Instructions for Candidates:

- 1. Question No.1 is compulsory. All questions carry equal marks. Attempt any 5 questions in all.**
- 2. Use of scientific calculator is allowed.**

- Q.1 (a) What is clustering in Machine Learning (2)
- (b) Explain the importance of dimensionality reduction techniques in machine learning. (2)
- (c) What is CNN? (2)
- (d) Define the types of errors that can occur during hypothesis testing of the data. (2)
- (e) Describe any 2 of applications of an ANN algorithm. (2)
- (f) What is overfitting in decision trees? (2)
- Q.2 (a) Explain how bias and variance contribute to the overall error of a model. (4)
- (b) Explain the concept of logistic regression and how it is used for binary classification tasks. (4)
- (c) Discuss any four applications of Machine learning. (4)
- Q.3 (a) Describe classification separating hyperplanes and their significance in machine learning. (4)
- (b) Define version spaces in the context of machine learning. (4)
- (c) Explain how version spaces represent the set of all hypotheses consistent with the training data. (4)
- Q.4 (a) Discuss the steps to perform hypothesis testing in machine learning. (6)
- (b) Explain the working of an ANN with the help of suitable diagram. (6)

- Q.5 (a) Explain the Id3 algorithm for constructing decision trees. What are its disadvantages and how can we control it? (6)
- (b) What is KNN classifier? Explain with an example (6)
- Q.6 (a) Explain the SVM algorithm and how are they classified? (6)
- (b) Differentiate between Maximum Likelihood Estimation (MLE) and Bayesian Parameter Estimations Models. (6)
- Q.7 (a) Discuss the ensemble methods in machine learning. (4)
- (b) Discuss the methods used for evaluation measures used for classification techniques. (4)
- (c) Explain the Gaussian Mixture Model (GMM) for clustering and density estimation. (4)