

Seat No. **MAR_APR 2025 SUMMER EXAMINATION****11731 Bachelor of Technology (NEP-2.0)****Sub. Name: Introduction to Machine Learning****Sub. Code: 94354****Day and Date: MAY ,13-05-2025****Total Marks: 70****Time: 02:30 PM To 05:00 PM**

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
 2. Draw neat labelled diagrams wherever necessary
 3. Figures to the right indicate full marks

Special Inst.: 1. Solve any four questions from Q. No. 1 to Q. No.5
 2. Question no. 6 is compulsory

- Q1)** Solve the following questions. [15]
- a. What is gradient descent, and how is it used to optimize the cost function for a neuron? [8]
- b. Explain in detail Logistic Regression. [7]
- Q2)** Solve the following questions. [15]
- a. What is unsupervised learning ? Explain in brief K-Means clustering algorithm. [8]
- b. Discuss the Apriori algorithm in association rule mining? [7]
- Q3)** Solve the following questions. [15]
- a. Define the Hidden Markov Model (HMM). What are its primary components and applications? [8]
- b. What is the Naïve Bayes classifier? How does it classify instances using Bayes' theorem? [7]
- Q4)** Solve the following questions. [15]
- a. Explain one-vs-all (OvA) and one-vs-one (OvO) approaches in multiclass classification. How do they handle multiple classes? [8]
- b. Explain dendrogram in hierarchical clustering. How is it used to visualize clusters? [7]
- Q5)** Solve the following questions. [15]
- a. What is the role of the parameter 'K' in K-NN? Explain the K-Nearest Neighbor [8]

(K-NN) classifier

b. Explain the kernel trick in SVM. [7]

Q6) Write a short note on (any 2) [10]

a. Data visualization in machine learning [5]

b. Feature Scaling [5]

c. Compare Decision Trees and Support Vector Machines. [5]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -

This Question Paper may be distributed for following Subjects as common code.

सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (94354) Introduction to Machine Learning Part 3 SEM 6