



**ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU -27**  
**BCA(DATA ANALYTICS) – V SEMESTER**  
**SEMESTER EXAMINATION: OCTOBER 2023**

(Examination conducted in November /December 2023)

**BCADA5223 – Machine Learning**  
**(For current batch students only)**

Time: 2 Hours

Max Marks: 60

This paper contains **TWO** printed pages and **THREE** parts

**PART-A**

**ANSWER ALL THE QUESTIONS**

**5 X 2 = 10**

1. Discuss the types of learning with an example.
2. Write the use of Radial Basis function.
3. List the advantages of bagging over boosting.
4. What is perceptron? When does the perceptron fail to converge?
5. Why in data analytics the data are considered as curse of dimensionality? How to overcome this?

**ANSWER ANY FIVE QUESTIONS**

**5 X 4 = 20**

6. Consider the following set of training example

| Instance | Classification | A1  |
|----------|----------------|-----|
| 1        | +              | 100 |
| 2        | +              | 200 |
| 3        | -              | 250 |
| 4        | +              | 350 |
| 5        | -              | 400 |
| 6        | -              | 150 |

What is the entropy of this collection of training example with respect to the target function classification?

7. Distinguish Linear Vs Logistic Regression with appropriate example.
8. Write short notes on the recommendation system.
9. Describe the working behavior of the support vector machine with a neat illustration.
10. Discuss probability-based learning with an example.

11. Write short notes on Linear Discriminant Analysis.
12. Discuss any one algorithm used for speech recognition.

**ANSWER ANY THREE QUESTIONS**

**3 X 10 = 30**

13. Explain the steps in the k-means algorithm. Cluster the following set of 4 objects into two clusters using k-means A(3, 5), B(4, 5), C(1, 3), D(2, 4). Consider objects A and C as the initial cluster centers.
14. Explain Lasso & Ridge regression with suitable example.
15. Given 14 training examples of the target concert play tennis with attributes outlook, temperature, humidity and wind. The frequency of play tennis = 9 Frequency of not play tennis = 5 Conditional probabilities are given as

| Day | Outlook  | Temp | Humidity | Wind   | Play tennis |
|-----|----------|------|----------|--------|-------------|
| 1   | Sunny    | Hot  | High     | Weak   | No          |
| 2   | Sunny    | Hot  | High     | Strong | No          |
| 3   | Overcast | Hot  | High     | Weak   | Yes         |
| 4   | Rain     | Mild | High     | Weak   | Yes         |
| 5   | Rain     | Cool | Normal   | Weak   | Yes         |
| 6   | Rain     | Cool | Normal   | Strong | No          |
| 7   | Overcast | Cool | Normal   | Strong | Yes         |
| 8   | Sunny    | Mild | High     | Weak   | No          |
| 9   | Sunny    | Cool | Normal   | Weak   | Yes         |
| 10  | Rain     | Mild | Normal   | Weak   | Yes         |
| 11  | Sunny    | Mild | Normal   | Strong | Yes         |
| 12  | Overcast | Mild | High     | Strong | Yes         |
| 13  | Overcast | Hot  | Normal   | Weak   | Yes         |
| 14  | Rain     | Mild | High     | Strong | No          |

Classify the new instance whether play = yes or No (Outlook = sunny, Temp = cool, Humidity = high, wind = strong) using Naive Bayes Classifier.

16. With neat sketch describe some of the machine learning techniques used in Image recognition.