



## End Term (Even) Semester Examination May-June 2025

Roll no.....

Name of the Program and semester: BCA

Name of the Course: Fundamentals of Machine Learning

Course Code: TBC 603

Time: 3 hour

Maximum Marks: 100

### Note:

- All the questions are compulsory.
- Answer any two sub questions from a, b and c in each main question.
- Total marks for each question is 20 (twenty).
- Each sub-question carries 10 marks.

Q1. (2X10=20 Marks) CO1

- What is Machine Learning? Discuss the difference between supervised and unsupervised machine learning. CO1
- What is deviation in statistics? Discuss different types of deviations with example. CO1
- Calculate the mean, median and mode for the given data points CO1  
{2 3 1 4 6 4 8 10 23 11 86 12 24 20 2 3 11}

Q2. (2X10=20 Marks)

- Discuss 'for' statement in python? Also explain range function. Write a python program to display first 'n' palindrome numbers. Take n as input from the user. CO2
- Discuss datatypes in python. Explain the differences between mutable, and immutable datatypes with example. CO2
- Write a python program to find power of a number using recursion. Both number and power should be taken as input. CO2

Q3. (2X10=20 Marks)

- What is unsupervised machine learning? Discuss clustering and its types. CO3
- Explain k-means clustering with complete algorithm steps using the example given: Find centers after 1st iteration for the given points:  
a1(1,3), a2(3,2), a3(4,5), a4(3,6), a5(2,5)  
distance formula is :  $|(X2-X1)+(Y2-Y1)|$   
Initial centers are (3,2) and (2,5) CO3
- What is Dimensionality Reduction? Discuss Low Variance Filter and High Correlation Filter with example. CO3

Q4. (2X10=20 Marks)

- Write the steps to load a csv file and then fill all the NaN values with mean in the file. CO4
- What are the different datatypes available in python pandas library. Discuss steps to create them. CO4
- Write a python program to create an array of 2X2. Find the inverse of this matrix. CO4

Q5. (2X10=20 Marks)

- What is supervised machine learning? Discuss its advantages and disadvantages. CO5
- Differentiate between classification and regression with suitable example. CO5
- Discuss any two of the following: CO5
  - Linear Regression
  - K-Fold Cross Validation
  - Naive Bayes
  - Artificial Neural Networks.