Duration 3 Hours **[Maximum Marks 80]**

NOTE:-1) Question 1 is **compulsory**
2) Solve **any three** from the remaining five questions
3) Assume suitable data if necessary.
4) Figures to the right indicate full marks

Q.1. a. Explain the concept of logistic regression. **20**

b. Explain the use of entropy while forming a decision tree.

c. List and explain in short design steps of forming a machine learning model.

d. Explain the terms: hyper plane, support vector that are used in SVM**.**

Q.2. a. Explain different error measures used for performance of regression. **10**

b. Explain the concept of under fitting and over fitting and perfect fitting with suitable diagrams. How to avoid under fitting and over fitting? **10**

Q.3. a. Explain the difference between linear regression and multiple regression? How will you compute cost function in linear regression? **10**

b.Find a linear regression equation for the following data: **10**

x	2	4	6	8
y	3	7	5	10

Q.4. a. Explain the steps used in forming Classification and Regression Trees. **10**

b. Explain Baye's theorem. Give suitable examples. **10**

Q.5. a. Explain Quadratic programming solution to find maximum margin separator. **10**

b.What are different kernels used for learning non-linear functions? **10**

Q.6. a.What is expectation maximization algorithm? Explain how it works for estimating the model parameters . **10**

b. Explain the steps involved in developing the ML model for Credit card Detection. **10**

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