

# C. V. Raman Global University, Odisha

Exam: - Repeat-Mid Sem. (2021) Semester: - 6<sup>th</sup> Branch: - CSIT/CSE

Subject: -Machine Learning (CS30140)

Duration: - 90 min, Full Marks: - 60

(Answer all the questions)

## 1. Answer the following questions:

[2.5X8]

- Mention the type of a differentiable activation function in a neural network and write the formula for the same.
- Explain a scenario, where precision is more desirable than accuracy.
- Justify how the value of 'k' affects the performance of KNN?
- Identify the regression type that is applicable for both classification and regression with giving a brief explanation.
- Write the significance of "stratified k-fold Cross validation" method in supervised learning.
- Differentiate between loss function and lost function in machine learning by giving a suitable example.
- Justify the reason why lazy learnings are not preferable to use in real time data analysis
- Differentiate between linear regression and polynomial regression.

## 2. Answer all:

[10X2]

- 'Dev' is a machine learning engineer. He is working on a project where he has to build a prediction model for detecting the COVID infection. He has given with the symptoms data set for 50000 patients. Which model and which evaluation measures he should consider so that the model can really work well for predicting the infection. Write your answer with giving sufficient justifications.

Perform KNN Classification algorithm on following dataset and predict the class for X (P1=6 and P2=4) with K =3

P1	P2	Class
7	7	False
7	4	False
3	4	True
1	4	True
6	7	False

## 3. Answer any two:

[10X2]

- An analyst studying a chemical process expects the yield to be affected by the levels of two factors, x1 and x2. Observations recorded for various levels of the

two factors are shown in the following table. The analyst wants to fit a first order regression model to the data.

Observation No.	Factor 1( $x_{i1}$ )	Factor 2( $x_{i2}$ )	Yield( $y_i$ )
1	31.9	39.1	251.3
2	53.4	39.3	251.3
3	54.9	39.5	258.3
4	54.5	39.7	267.5
5	57.3	39.9	273.0

- b. Considering a simple neural network with a single hidden layer, uses a threshold activation function; where  $\Theta=1$ , given on a set of input [1.1, 2.5, 2], weight  $t$  [.3, .4, 1.4] and [0,1]. Calculate the change in weight for the first iteration.
- c. Consider a single perceptron with sigmoidal activation function. The perceptron is represented by a weight vector [.5, 1, -1] and bias=0. If the input vector to the perceptron is represented by [.2, 1, 1.4], calculate the output.